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Principal Contents

ILLUSTRATIONS

PAGE

471 Bilateral School, Buckinghamshire. By F. B. Pooley

477 Narrow Fronted Housing, Streatham. By H. Owen Luder

480 Addition to Westcott House, Cambridge. By Cecil J. Bourne

ARTICLES

474 Aluminium in European Building: Developments Seen on a Recent Tour

482 More Everyday Things—59. By Arthur W. Kenyon, CBE

485 Work by Private Architects: New Commissions Fall for Second Quarter

486 Airline Engineering Base, Nigeria: Lagos Scheme

488 Value for Money: Paper by J. L. Womersley

490 Building and the Economic Crisis: Need to Stop Extravagant Building

491 'The Little Squeeze': FCEC Views

492 The Future of the Conurbations: Paper to Planning Summer School

495 The Quantity Surveyor's Office Today: Modernisations of Techniques

498 British Construction Overseas: Fall in the Value of New Contracts.

500 New York Island Community: Transformation of Waste Land

501 Hospital Floor Seals: Interim Report of Experiments with Ward Floors

Leading Articles

Control of Design

THROUGH THE GREATER PART OF THIS CENTURY, and especially since the end of the first World War, British Society has been concerned about the decline of the architectural quality of the mass of building going on apace throughout the country. In particular this concern has been principally to do with speculative building which accounts for the main spread of building over town and countryside. More recently it has extended over the whole range of building. Never as today have there been so many people so much worried about so much building.

This is by no means the only phenomenon to perplex us in these complicated times, but it is one of the most important. The call for control is widespread, natural and persistent, and to many this seems a simple solution which only cowardice delays. It would seem as easy to apply as the by-laws which regulate the size of our drain pipes, the thickness of our walls and the activity of local authority staffs. The nearer we get to the subject, however, the more inappropriate the analogy reveals itself to be, for we cannot apply the routine of a factual exercise to the deep moving of the spirit which any matter of art involves.

Some brave experiments have been tried to meet this purpose, but few would claim that these have not been beset by many difficulties, or that they have achieved the desired results in practice. Soon after the first World War the CPRE devised a Panel system of mixed composition, which hardly functioned at all, and this was followed in the late 'twenties by an RIBA Panel system manned only by architects which worked up to the outbreak of the last War. At that time architects were able to speak with some unanimity, for Modernism was then hardly respectable. The result, therefore, was a fairly consistent code of judgment, whether right or wrong. Yet when we talk to some of the older men who took part in the system in those days, very few of them seem to feel that their efforts had any perceptible effect upon the face of Britain. Since the War the system has been a little more generally revived and some hard and devoted work has been done. Is anyone satisfied with it? The answer is that not even the panel members themselves would say 'Yes.' In years to come, when it is possible to look back, these members will probably feel as the older men do now about the work to which they applied themselves so devotedly years ago.

Why is it that the Woods of Bath and Nash of Regent

Street managed to grace the scene so effectively in spite of their trade interests, and satisfy the taste of their public? Today even the most disinterested architect seems often to fail to carry his public with him. Of course we do not know how many of the 16th-century masons shook their heads over the strange ornament the Italian craftsmen brought into the country, nor whether the Elizabethan architects would have approved the full-dress Renaissance of Inigo Jones, but there remains no evidence of a Battle of the Styles in those days. Of course, the writers of the times criticised the extravagance of Vanbrugh and the stucco of Nash, but in terms more political than stylistic.

It is surely a fact that much of our problem arises from the deep cleavage which has developed between professional and lay taste in architecture, and this may not be entirely the fault of the non-professional. Architects have always led patiently through the tastes of their patrons, and the only patron the architect now has is the British Public. Have architects moved a little too fast for them? It will be remembered that Wren was not allowed to abandon the traditional form of a cathedral plan, yet few of us would have St. Paul's any different. Perhaps this is why control is so difficult to make effective, because the taste of a healthy society would need little or none.

Our aim today would therefore seem to be very much what the Chancellor has in mind at the present moment —to devise a short-term plan to stop the rot, and a long-term plan to set us permanently on our feet. Our short-term objective remains to prevent imminent damage to town and country, and our long-term programme a period of self-education to create a society which can control itself. We need, in fact, to do some very clear thinking, both architect and layman alike. We should be indeed foolish, for instance, if we assumed that the headlong growth of the last fifteen years or so is an endless movement which will go on for ever at its present rate. Many thoughtful people believe we are very near the brow of the hill, beyond which is a reverse slope beset with many hazards. Our planners do not seem to have any such possibility in mind, and perhaps some of the pressures which beset them arise out of a false picture of the gradient ahead. It may well be that whether we like it or not, we are about to enter a period in which there will be more time to think things out and to resolve ourselves into some harmony of objective.

Whatever the future promises, we have still the short-term problem to solve, which is to raise the standards of what is now in prospect. This is not a country to tolerate dictators, and a dictator of taste will be one the least acceptable. On the other hand, while we are all aware of the defects of committee work and of voluntary public service, these are institutions which have done most to keep this a relatively free country. The Panel system is part and parcel of this characteristic of the British way of life, and we shall probably be wise to persevere with it until, after long and painful times, we recover the right balance in a society which resolves the public taste with the patient ambitions of the artist.

Architectural Education in the Commonwealth

IN RECENT YEARS schools of architecture have been set up in East Africa, Ghana, Malaya, Nigeria and Singapore, also in the Sudan. The University school in Hong Kong has been reorganised. New schools have also been established in India; architectural education in Pakistan and the West Indies has been under review. Architects from Britain and other older Commonwealth countries have helped in their foundation, providing advice and teaching staff, and serving as external examiners.

Naturally these schools have modelled their pattern of education on that developed in Britain by the RIBA and followed for many years in Australia, Canada, New Zealand and South Africa. At the start they took as their objective the Institute's Intermediate and Final examinations. To permit some flexibility the Board of Architectural Education introduced its Special Overseas Scheme. The Informal Conference (which met at the RIBA last month—see 'The Builder' of September 1) has suggested that this scheme be extended to allow examination papers to be set and marked locally subject to a periodical review of standards by the Board. As more overseas universities set up schools of architecture with their own degree courses, the Institute's external examination machinery will tend to fall into disuse. Issues like that of registration in the United Kingdom then will become matters of importance.

On this issue and on such matters as standard of education on entry to a school of architecture, as well as on details such as the syllabus to be followed and the teaching staff needed, the Conference was agreed on the broad lines of development to be followed in the next few years. There should be flexibility in interpretation but the standards of entry and qualification must continue to be based on those in Britain. Not only are they generally accepted in the Commonwealth, but they also have international standing.

Rightly the Conference concerned itself mainly with issues of the present and the near future. Its recommendations will serve as an invaluable guide both to the RIBA and to the principals of schools overseas. Yet in planning architectural education, longer-term problems cannot be ignored. What kind of architect is needed in developing countries? What form an architectural profession in them will take? In Britain the architectural profession, as we know it to-day, is a product of the nineteenth century and depends on an informed and prosperous client—private individual or corporation—for its wellbeing. In turn the RIBA system of architectural education is based on a high-principled profession running its own affairs.

In many developing countries the local architectural profession is yet far from soundly founded. Often it has still to depend for its professional activities largely on architects from Britain temporarily in the country. It is far from certain whether in all these countries the kind of architectural profession which we know here will survive the wind of change. Does it then mean that Government—both in the interest of public safety and amenity, and in its own interest as the principal user of architectural skill—may not have to concern itself more with standards of professional competency? This happens in Hong Kong where authorisation to practise as an architect is controlled by government, though now to standards related to those of the RIBA. (In passing it should be noted that the principal French architectural society is that of Architectes Diplômés par le Gouvernement.)

Again, as the Informal Conference noted, the need for supporting less highly trained workers in the drawing office and on the building site is great. It has to be met quickly if the building and housing programmes which countries like India and Nigeria faced are to be fulfilled. Have general standards of architectural education to be lowered to meet this need? Or can both these men and the architects of high academic and professional quality, which are also badly needed, be trained at the same time?

Such issues could only be touched on at last month's Conference. They should be matters for frank discussion at the full Commonwealth Conference planned for 1962.

Notes of the Week

Architects' Commissions Decline; 'Building Matters'; Building Overseas; Designs in Ceramics; Globe or Mermaid?

THE FALL in the value of work commissioned of architects in private practice noted in the first quarter of this year has been continued into the second. This trend is shown in the figures now issued (see page 485) by the RIBA statistician's department and must be regarded as disturbing. The actual figures for the period April-June 1961 were £253m. compared with £282m. in the first quarter of the year and £271 in the same period a year ago. As the RIBA point out, this represents a fall of 10 per cent over the first quarter of the year and of 7 per cent over the second quarter of 1960, though, since tender prices have risen in the past year and architects have presumably taken some, if not full account of this in their estimates, the actual volume of new buildings commissioned compared with a year ago has probably fallen by 9-10 per cent rather than the 7 per cent which a strict calculation shows.

It should be remembered that the second quarter of the year normally shows a fall in relation to the first quarter, and the current position is not to be regarded as a major decline. Nevertheless, this is the first time that two successive quarters have shown a fall in total commissions, and (when the second quarter figures for 1961 and 1960 are taken into account) this suggests that the boom in new commissions ended in 1960.

The policies announced by the Chancellor in July will only aggravate what must be recognised as a trend towards decline, and give added force to the argument that—by reason of the fact that the time-lag between commissioning and executing building work gives a false impression of the industry's state of well-being—the Chancellor's hand on the economic brake must be a sensitive one if dislocation is to be avoided not only of architects' offices but of contractors' and materials suppliers' organisations. No opportunity should be lost of pressing this fact upon the Treasury.

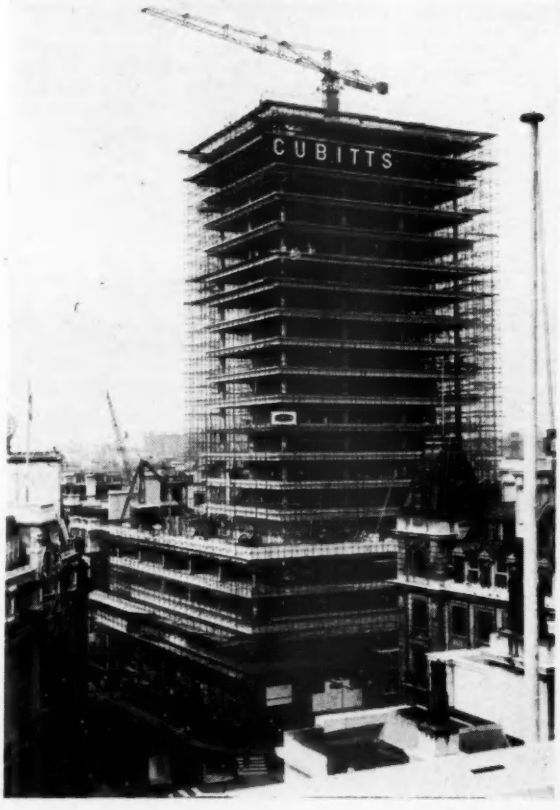
* * *

FROM THE RIBA'S INTERESTING REPORT, two other facts may be noted, first, that commissions from public authorities have reversed a previous trend and were gaining on private commissions (the explanation given is that public authorities were able to start all of their 1960-61 programmes well before the end of the 1960-61 financial year and have now made a vigorous start on the next financial year's programme); the second, that the general decline noted seems to have hit the small and medium-sized architects' offices less severely than those of the large firms—firms, that is, with 11 or more staff. One positively satisfactory feature is that in value terms, the ratio of cancelled or postponed work to all new commissions fell from a ratio of 1:10 in the first quarter of 1961 to 1 : 14 in the second.

'Building Matters'

IF RUMOUR BE TRUE that the BBC 'Building Matters' programme is to go off the air, at least for the next quarter, many will be disappointed. It is fact that the

TWO TALL BUILDINGS.—*Left: View showing an advanced stage in the construction of New Zealand House on a site at the junction of Pall Mall and Haymarket, London, W1, the site formerly occupied by the Carlton Hotel. The work is being carried out for the New Zealand Government by Messrs. Holland & Hannen and Cubitts (Great Britain) Ltd. to designs by Messrs. Robert Matthew and Johnson-Marshall. The consulting engineers are Messrs. Scott and Wilson, Kirkpatrick and Partners. Right: A progress picture of the 400-ft. high Co-operative Insurance Society Ltd.'s office block in Miller-street, Manchester, being constructed by Messrs. John Laing Construction Ltd. This building, Britain's tallest to date, is part of a development project for which the architect is Mr. G. S. Hay, FRIBA, chief architect, Manchester Co-operative Wholesale Society Ltd., in association with Sir John Burnet, Tait and Partners.*



earlier series came in for criticism because of their alleged dullness due to the dominance of interested bodies and the reading of too many technical reports, but that could not be said of the last series, in which a great many matters of everyday interest were thrashed out in a spontaneous, lively and useful manner.

If there were any ground for criticism, it would be of the policy of retaining the same team of speakers, week after week, with the occasional introduction of a guest. This is not to criticise Messrs. Crichton, Mills and Pearce, who all did remarkably well. It may be that the industry is short of good broadcasters, but it should be possible to find more than three regulars for the programme.

* * *

BUILDING NOW GIVES more employment than any other industry and is responsible for spending more than £2,000 million a year. It would be odd if the BBC could not find half-an-hour a week for the discussion of matters affecting an industry on whose efficiency the welfare and prosperity of the nation so largely depend. If in fact the programme is to be suspended we hope the BBC may be able to reinstate it in January.

Building Overseas

FIGURES of British construction work overseas in so far as they relate to new contracts obtained show a very appreciable fall as compared with the previous year, when £131m. worth of work was obtained. Only £98m. is being carried out in the current 12 months; moreover, since in the Ministry of Works' view the cost of building has almost certainly risen overseas as well as in the UK, the decrease of £33m. reflects an even more substantial drop in the number of contracts obtained.

In forecasting these figures in a leading article on August 4, we suggested that the British building industry as a whole, including particularly manufacturers of materials and components, ought to look much more closely at the overseas market than at present it does. We also suggested that the Minister of Works might consider calling a conference of producers interested in this market, at which opportunities, difficulties and help available (such as the facilities offered by the Export Credits Guarantee Department) could be outlined. We hope that this suggestion will be considered; when Great Britain enters the Common Market (and this looks to be inevitable), industry's one chance of survival in the face of severe Continental competition will be the existence in every industry of a strong nucleus of experienced exporters.

Designs in Ceramics

THE EXHIBITION of 'Ceramic Design in Modern Building,' which for the past week has been on display at the Tea Centre in Lower Regent-street, London, SW, has thrown up at least one product as yet unfamiliar in this country. It is called a shadow and facet tile and is designed for use in mural panels, relying for relief on the play of light and shade effected by the use of projecting tiles. All the exhibits were worth close attention, both for the vigour and imagination with which they were conceived and their obvious practical and comparatively inexpensive application—the tiles shown are available in a wide range of colours, textures and projections.

Among the murals was one called 'Play Bill,' a textured tile panel, using nineteenth-century type face; another used a pattern of circular projections in bold contrasting relationship (leopard tiles); and a third used printed tiles based on medieval German playing cards and arranged in a random repeat. There was one interesting large scale architectural mural using standard production tiles; and another with mono-relief projection tiles in contrasting texture and colour. One of the more expensive items was a lovely panel of richly coloured ceramic reliefs by Ann Wynn Reeves of Kenneth Clark Pottery. To make the show as diverse as possible the organisers put in a selection of domestic pottery, an individual ceramic sculpture by Vivien Cole, a barbecue, a terracotta fireplace by Angela Metcalf, various bits of familiar-looking ceramic mosaics, and fine pierced ceramic screen with tree motif for use as a decorative panel. The exhibition was arranged by Ceramic Design Consultants Ltd., and closes today.

Globe or Mermaid?

NOW THAT THE DREAM of a National Theatre is to become a bricks-and-mortar reality the question of what shape it should take is being discussed to determine whether it should conform to a tradition and if so what tradition? In 'Drama,' the quarterly theatre review, W. Bridges-Adams discusses this knotty little problem, weighing up the likely attitudes of dramatists, actors and audiences. The ramifications are very wide indeed—the apron stage, the proscenium, the forestage and the arena stage or theatre in the round. Purists will come forward to protest that plays should be performed in the setting for which they were originally written.

Mr. Bridges-Adams properly reminds us that a National Theatre will inherit no tradition; altogether new, it will be pledged to rediscover such standards as we have lost and must give proof that it is alive and progressive in a wildly changing world. There is no reason whatever why all kinds of production, from Victorian melodrama in a picture-frame to 'Under Milk Wood' on an apron stage, cannot be equally well catered for. In any case we are promised two theatres under one roof, but even in one, given a modicum of compromise, there should be little difficulty in conforming to all the essential requirements of theatre techniques from the Globe to the Mermaid.

Poet's Corner

Conflicting views have been lately expressed on the subject of high buildings.

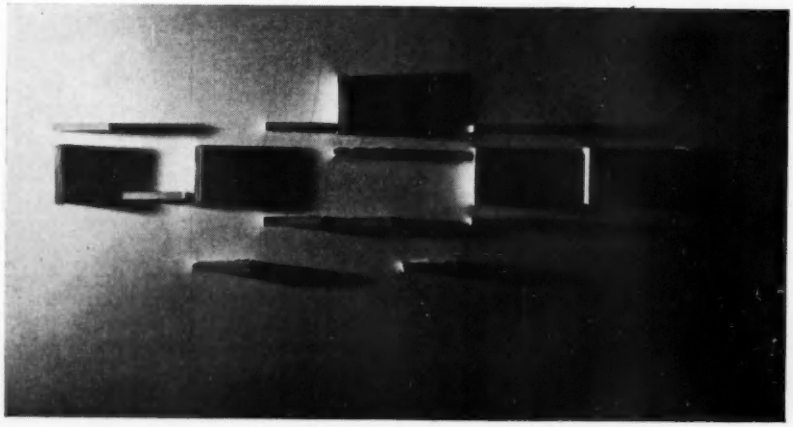
'Land is so precious,' is the cry,
'Where e'er we can we *must* build high;
The skyscraper is here to stay
Because there is no other way
To give accommodation and
Conserve our valuable land.'

'Not so,' the critic makes reply,
'There's no real gain in building high;
The cost is more, and space around
These monstrous buildings are a blight—
Build to a reasonable height!'

To which belief do you belong?
And which is right and which is wrong?

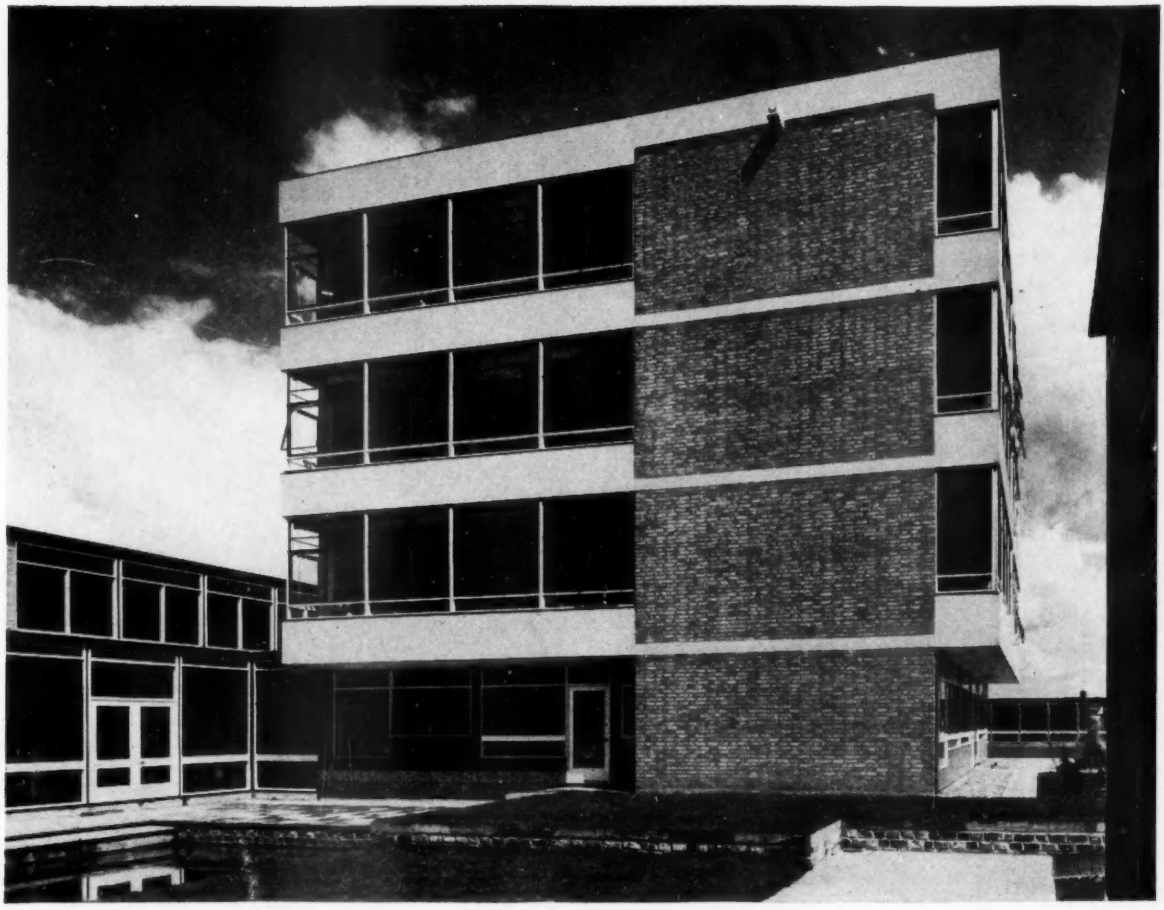
ANON.

TWO CERAMIC EXHIBITS AT THE TEA CENTRE.—*Left: A mural formed by projection tiles constructed from standard units and colour combinations. Right: Ceramic reliefs by Ann Wynn Reeves of Kenneth Clark Pottery*



Bilateral School, Buckinghamshire

F. B. POOLEY, FRIBA, AMTPI, county architect
C. HINDLE, ARIBA, assistant county architect
J. M. DEAN, ARIBA, senior assistant architect
DRABBLE CONSTRUCTION, LTD., general contractors



the 4-storey teaching block

RADCLIFFE BILATERAL SCHOOL, Wolverton, is the first of its type in Buckinghamshire and forms part of a campus of educational buildings which include a College of Further Education now nearing completion, a Secondary Modern School to be commenced in the future, and the Bilateral School which has recently been completed.

The teaching spaces are planned in a four-storey block which is the focal and geographical centre of the scheme, and is directly linked to the main assembly hall and dining room and by internal circulation to the science and practical blocks. The assembly hall and dining room have been planned together and are divided only by a folding screen. The two spaces total more than 5,000 sq. ft. and not only can accommodate the largest school assembly, but will be of great use for the social life of a school for 720 pupils.

Because of the abnormal number of laboratories and workshops which are required in this type of school, and the fact that the teaching of science and workshop subjects could well change over the next few years, they have been planned in single storey structures grouped around the main assembly hall and classroom blocks, forming a series of internal courts. They are built on a light steel frame not only for ease of construction, but so that they can be easily replanned internally or added to as may be required in the future.

North Buckinghamshire is a very difficult area in which to build because of the shortage of skilled building labour and it was, therefore, necessary to use a structural system which gave a high productivity from the labour force available on the site. The central teaching block is constructed of load bearing brickwork with in situ and precast concrete floors, whilst the remainder of the building is constructed on a light steel frame with timber panel cladding.

This building technique is part of a continuous policy followed by the Bucks. County Council aimed at making the best rational use of traditional

materials which are currently in good supply, with the advantage of being able to obtain competitive tenders from the building industry at large. This school, which was commenced in 1958, was built at a cost of 70s. 3d. a sq. ft. which compares favourably with prices being paid at that time for CLASP construction (see Building Bulletin No. 19 issued by the Ministry of Education).

The County Council are generally satisfied that their flexible policy, making the best use of materials currently in good supply, gives them a better capital investment than building in proprietary or special systems of construction. They also feel that with the encouragement of general rationalisation of techniques combined with competition from the building industry as a whole they are likely to make a greater national contribution towards an overall improvement in the industry than by specialising in any one direction.

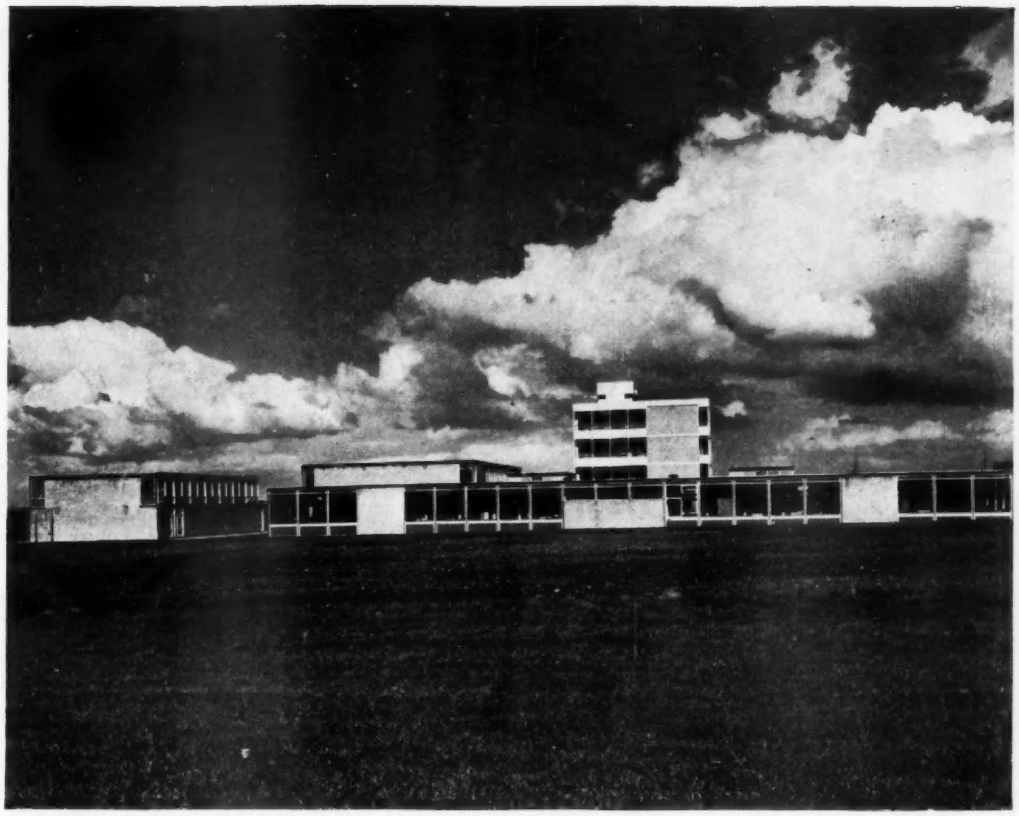
From the architect's point of view, because of the full design freedom which is available by the use of traditional materials and techniques, each building can be properly related to its site and constructed in materials likely to mature in a reasonable fashion. Contract cost: £239,933, including £14,860 for furniture and equipment.

teaching block from the practical block

internal court to science block

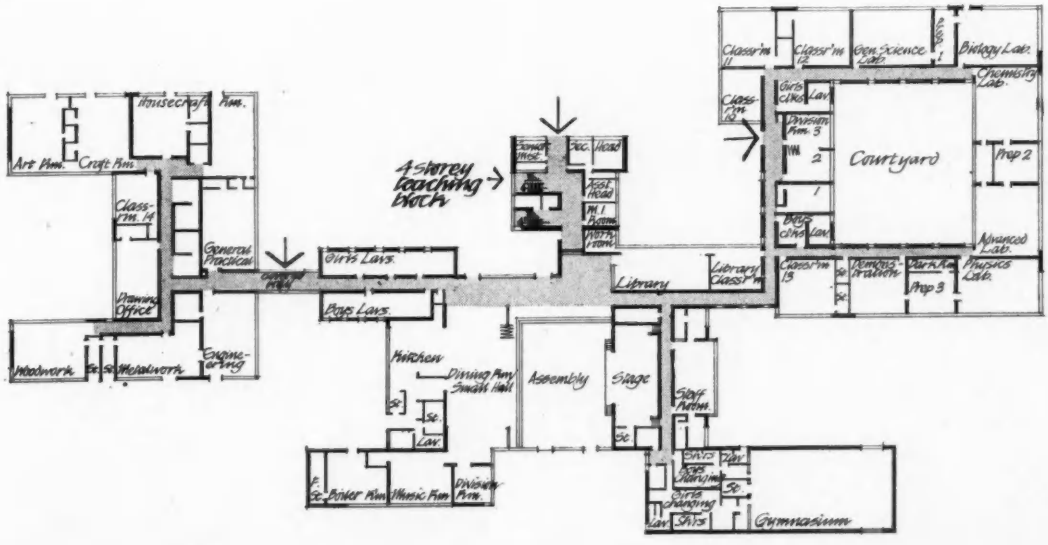
sub-contractors & suppliers:

Prestressed and reinforced concrete: Concrete (Southern) Ltd.; *electrical installation:* Rashleigh Phipps & Co. Ltd.; *heating and water services:* Edward Deane & Beal, Ltd.; *metal windows:* Rea Metal Casements Ltd.; *wood block and strip flooring:* Hollis Bros. Ltd.; *ironmongery:* Lockerbie & Wilkinson (Birmingham) Ltd.; *sanitary fittings:* B. Finch & Co. Ltd.; *built-in furniture:* Webster & Cannon Ltd.; W. T. Revitt Ltd.; *laboratory fittings:* Frederick Tibbenham Ltd.; *sliding folding partitions:* Herbert E. Taylor & Co. Ltd.; *timber roller shutters:* J. Taylor (Syston) Ltd.; *steel roller shutters:* G. Brady & Co. Ltd.; *fibrous plaster ceiling panels:* James Walker (Architectural Decorations) Ltd.; *cold room installation:* The Lightfoot Refrigeration Co. Ltd.; *stage equipment:* G. B-Kalee; *gymnasium equipment:* Olympic Gymnasium Co. Ltd.; *stainless steel sinks and working tops:* G. F. E. Bartlett & Son Ltd.; *Formica working tops:* Almet Designs Ltd.; *roller blackout blinds:* J. Avery & Co. (Est. 1834) Ltd.; *greenhouse:* V. & N. Hartley Ltd.; *cast iron spiral staircase:* David Rowell & Co. Ltd.; *fire hoses and reels:* George Angus & Co. Ltd.; *cycle storage rocks:* Le Bas Tuge Co. Ltd.; *Perspex nameplates:* Ward & Co. (Letters) Ltd.; *tennis court fencing:* Peerless Fence & Products Ltd.; *turfing:* R. B. Brazier Ltd.



general view of the group

Bilateral School, Buckinghamshire



PLAN SCALE: 1 in. = 80 ft.

Aluminium in European Building

Developments Seen on a Recent Tour

BY PATRIC BAKER

GREAT ADVANCES have been made in the last decade in the field of aluminium. The nature of the metal—its special properties of lightness, long life, resistance to weather and ease of maintenance—should provide adequate reason for extensive use in British building, but the record shows that less than 12 per cent of the aluminium consumed in this country goes for building purposes. In parts of Europe, however, the figure is as high as 60 per cent. And this, it appears, is only the beginning.

Comparisons tend to be odious, and in this instance a direct comparison between British and European practice would be misleading, mainly because of dissimilar building costs and price differentials between aluminium and other metals.

It was, then, with the object of studying Continental usage of aluminium rather than comparing practice that I recently inspected eight of Europe's finest modern buildings. My companion on the trip was an executive of a leading Canadian aluminium company who could put me right on technical points. Most of the buildings in question have been completed within the last two years; two are not yet finished. In all, very large quantities of aluminium have been used both inside and out.

A most impressive factor was the very high standard of finish. Equally striking was the ingenious way in which the architects used their aluminium components and fittings to heighten the dramatic impact of the structure and the functional simplicity of the interior, be it foyer, boardroom or general office. The question of ease of maintenance appears to rate particularly high in the costing of Continental buildings and this in many cases has obviously weighed the balance in aluminium's favour.

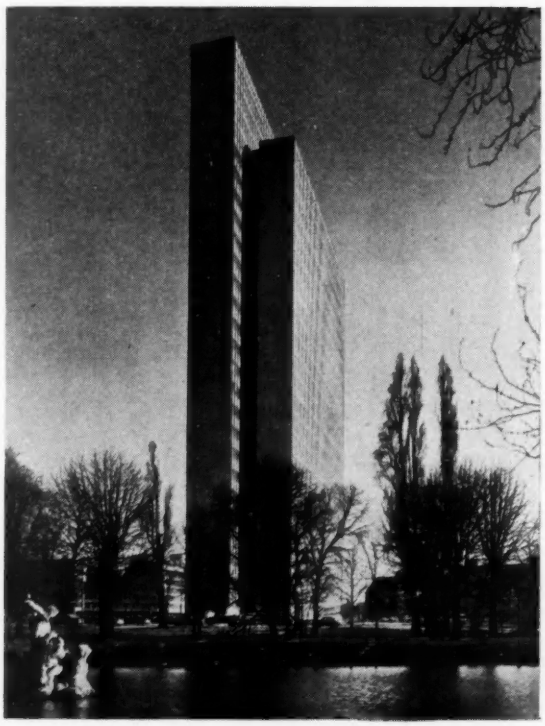
Buildings Visited

The first building visited was the Shell headquarters in Rotterdam. Finished in August, 1960, this is a striking, nine-storey design built over a foyer running the full length of the structure. Aluminium curtain walling and window units are used throughout, the latter being of standard, double-glazed, Thermopane type fitted with aluminium venetian blinds. Altogether, some 60 tons of the metal were used in the curtain walling and general decoration. The architect is C. A. Abspoel, BNA, who has specialised in aluminium for some years.

Some 30 miles away, at Amsterdam, is the largest group of exhibition halls in Europe. These are owned by the RAI, a Dutch industrial federation. The main building covers an area of about 40,000 sq. m. and contains four halls grouped in such a way that they can be combined when necessary by sliding back a series of aluminium-faced partitions which run in special overhead guides. In spite of their great size, these partitions can be moved easily by one man.

The biggest exhibition unit, the Europe Hall, is 225 ft. wide and 18 ft. high. To obtain maximum natural lighting without glare or excessive heat an ingenious 'saw-tooth wall' has been erected on the west side of the Europe Hall. This begins at a height of 13 ft. above an area of aluminium framed glazing, and has a staggered saw-tooth profile. Aluminium-faced sandwich panels are used for the sections facing the sun while those on the shaded section of the 'saw' are of glass. Thus, although there is no risk of direct sun penetration, the interior of the hall has the benefit of full daylighting. This saw-wall is flexibly suspended to cope with differences in temperature. The very large sections of glass in the walls of the remainder of the building are equipped with ribbed aluminium 'blades' or shutters which can be adjusted to suit the degree of sunlight. The architect, A.

Left: The Headquarters building of La Prevoyance Sociale in Brussels. The curtain walling consists of 1,140 aluminium elements, each removable at any time without disturbing the interior spandrel cover. Hugo van Kuyk, architect. Right: The Phœnix Rheinrohr Hochhaus at Dusseldorf. The total curtain walling area is 194,836 sq. ft., the panels being of enamelled steel with aluminium framing and profiles. Dr. Ing. H. Hentrich and Dipl. Ing. H. Peschnigg, architects



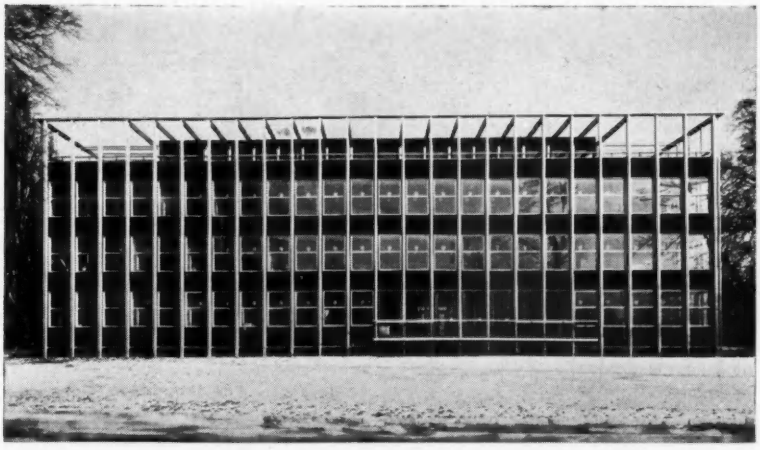
Bodon, is to be congratulated on a really outstanding project.

From Holland our survey took us to Dusseldorf in Germany to see one of the latest works of Paul Schneider-Esleben. This is the 25-storey office block recently completed for the Mannesmann Aktiengesellschaft, a leading German industrial concern. The Mannesmann-Hochhaus, as the block is officially called, is of bold, rectangular design, 290 ft. high, and has working accommodation for some 900 people.

The external skin of the building consists of white and blue porcelain-enamelled sheet steel wall panels set into a framed construction of natural colour anodised aluminium alloy extrusions. The panels are fixed by a mastic sealing agent which remains plastic. The corners of the building are formed by rectangular, rounded-off, aluminium sheets 4 mm. thick, which are inserted into the vertical edge profiles of the façade.

Use of aluminium curtain walling is a sound method of reducing maintenance costs, but all structures have to be inspected periodically and windows must be kept clean. The Mannesmann-Hochhaus overcomes the difficulty by running its own 'vertical railway' down the side of the building to enable cleaners to do their work with maximum efficiency and safety. The 'lines' for the railway are formed in the U-shape of the aluminium vertical façade profiles. These accommodate the guide-rollers of the suspended carriage from which the cleaners operate. A specially-built carriage moves up and down the profiles by means of a winch. Two vertical panels with a total width of 11 ft. 10 in. are cleaned at a time and the whole operation is press-button controlled.

One could quote many other outstanding examples of aluminium curtain walling in West Germany where the metal is rapidly achieving 'traditional' status. Among these is the Phoenix Rheinrohr building, also at Dusseldorf. This impressive cluster of three interlinked sky-scrapers has a total curtain wall area of 194,836 sq. ft. The panels themselves are of enamelled steel with aluminium framing and profiles. These sections are either anodised natural colour or light-blue. The double-glazed aluminium framed windows are independent of the inside insulation plates.



The AIAG Headquarters in Zurich. More than 55 tons of aluminium were used in the construction of this building. All visible metalwork is polished and anodised natural or brownish-black in colour. Prof. Hans Hofmann, architect

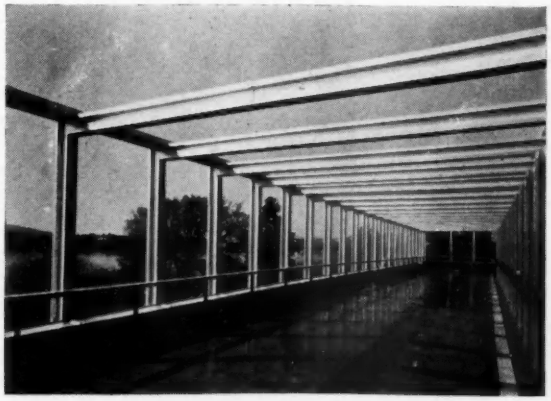
It is probably true to say that Switzerland has travelled further in the development of aluminium for building purposes than any other country outside the USA. The reason for this is largely economic; in Switzerland, where nearly all raw materials have to be imported, there is a much lower price differential between aluminium and other metals, notably steel. Also the Swiss insist on the utmost quality in everything they make. Building costs tend to be very high—a small detached private house, for example, retails at between £10,000 and £12,000 — but the standard of finish is probably better than anywhere else in the world.

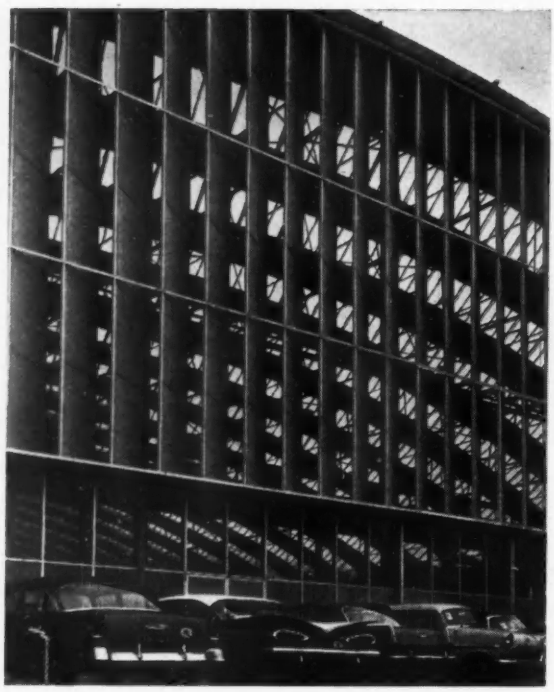
This is shown to advantage in the new headquarters of a Swiss aluminium concern, Aluminium-Industrie-Aktien-Gesellschaft, an elegant three-storey building with offices arranged round a central sky-lighted well. Each floor is reached by a central aluminium-clad spiral staircase which forms a dominant feature in the interior styling.

At first sight the building is particularly striking with aluminium clad uprights exposed to view at 5.75 ft. centres, dark anodised aluminium parapets and light-alloy sash windows with pale aluminium venetian blinds. The effect of this exterior styling is further enhanced by the reflection in the surrounding 'moat' in which the building is set.

From the outset AIAG insisted that

The AIAG building, Zurich. Below: A good example of aluminium cladding for structural members seen from the roof-garden. Right: The entrance hall; the handrails of the spiral staircase, the fountain bowl and the flat reflectors for the lighting system are all executed in aluminium





The saw-tooth façade of the RAI Exhibition Building at Amsterdam. Aluminium is used for the 'teeth' as well as for the curtain walling below. The saw-tooth design is used on the west wall of the Europe Hall to cut down sun-glare. A. Bodon, architect

aluminium should be used for every suitable application. For example, the entire façade of the building is aluminium. The mullions constructed in large natural-anodised aluminium sections are fixed by specially designed screwless clamps. The parapet panels are anodised sheets of NS5 magnesium-alloy finished in a brownish-black shade.

The building has a double-standing seam roofing of aluminium 0.7 mm. thick, while the chimney stack, containing both flues, is jacketed in aluminium rather like a venetian blind. Some 55 tons of aluminium were used in the AIAG building. The architect is Prof. Hans Hofmann.

No 'builder's holiday' in Switzerland would be complete without sight of one of the finest buildings put up since the war. I refer to the international headquarters of the Nestlé Company at Vevey. Designed by the Swiss architect, Jean Tschumi, it is the largest private office building in Switzerland and in 1960 won the Reynolds Memorial Award (value $25,000) for the finest aluminium building of the year. One is not surprised to learn that 250 tons of aluminium went into the Nestlé building.

The next phase of our fact-finding tour took us across the Alps to Milan. The Italians have produced some excellent aluminium - framed office furniture and we hoped to see examples of the 380-ft. high Pirelli skyscraper, one of the tallest buildings in Europe. This remarkable building was designed by a team of architects led by Gio Ponti, whom we were privileged to meet in his studio. Built around four immensely strong triangular terminal pillars of reinforced concrete, the Pirelli building has 31 storeys and a population of over 2,000. The curtain walling is of natural-colour aluminium alloy H30 sections with sandwich panels prefabricated from thermopane glass over a composite insulation of mineral-wool and aluminium and steel sheeting.

The fact that the Pirelli group are large producers of linoleum in addition to rubber products is evident in the cladding of the office and corridor walls. The combination of dark red ribbed linoleum and natural anodised aluminium framing gives a delightfully warm effect.

Located in the heart of the old section of Milan, the Olivetti building provides an interesting comparison with the Centro Pirelli. Closely flanked by shops and other offices, it consists of two wings; the main one, eight storeys tall, lies at the base of a courtyard and is particularly interesting for the vertical aluminium sun louvres running the length of each floor. These are manually adjustable in short sections. Aluminium windows are used throughout in conjunction with black anodised spandrel panels set in a concrete frame. The offices flank a central corridor, the larger rooms being quickly divisible by mobile aluminium partitions. The architect is G. A. Bernisconi.

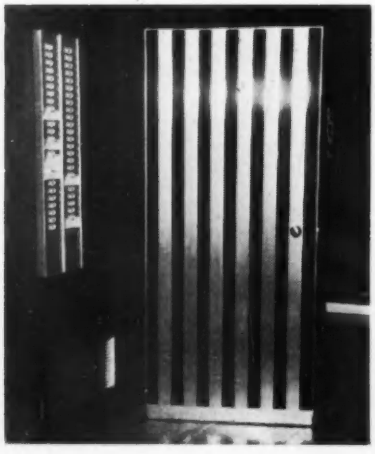
We concluded our survey in Brussels, with a visit to La Prevoyance Sociale office, a recent creation by the distinguished Belgian architect, Hugo van Kuyk. Particularly striking is the main entrance with its aluminium panelled escalator and sub-ceiling of bright anodised aluminium pressings. In this building the central heating boilers and all attendant piping were clad entirely in aluminium, and I have seldom seen a neater, more businesslike installation.

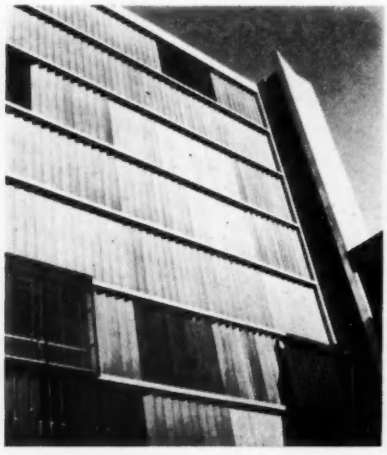
Future Applications

Development over the past ten years has been mainly in the field of extruded sections for windows and façades. Items now undergoing extensive research include the enamelling of aluminium sheet and the possibilities of using aluminium in conjunction with plastics.

The general approach to aluminium in the five countries visited can best be summed up in the words of a leading German architect, who said: 'We use aluminium because it is light, versatile and the most suitable material through which to project our ideas.'

Left: Aluminium striped door in the Pirelli building, Milan. Centre: Aluminium window shades on the Olivetti building, Milan. Right: The window-cleaning carriage at the Mannesman-Hochhaus, Dusseldorf, which moves up and down runners built into the aluminium profiles. The carriage is 'parked' in a special garage on the roof. Photo : Iuge Goertz-Bauer





Narrow Fronted Housing, Streatham

H. OWEN LUDER, ARIBA, architect
EAGLE CONSTRUCTION CO. LTD., general contractors

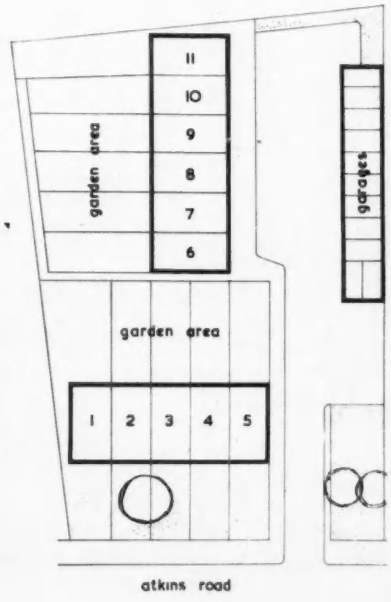
view from Atkins-road

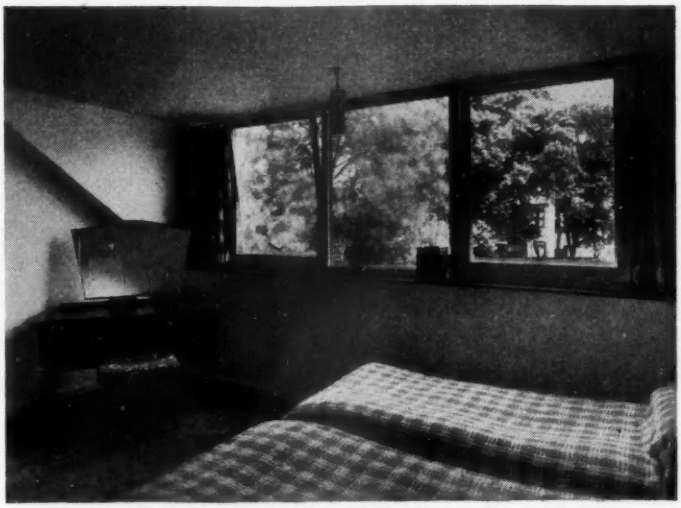
THIS GROUP of 11 houses in Streatham, replace an old Victorian house. The site has a frontage of 120 ft. and a depth of 200 ft., and is zoned for a density of 70 persons per acre. The contractor-client required a development of two-storey housing which, with normal arrangement, would achieve a density of only 30 persons per acre. By designing narrow fronted terrace houses and producing a satisfactory layout in depth the maximum density was achieved.

The layout is therefore two blocks of terrace houses with five fronting the existing road and the remainder at right angles to the rear of the site. A service cul-de-sac road is provided giving vehicular access to the rear block. Garages are placed in a separate block facing the new cul-de-sac road. Town planning requirements called for a minimum depth of 40 ft. for the rear gardens, and these are provided with a rear pedestrian access to all houses. Front gardens are combined, and a fine existing tree has been retained.

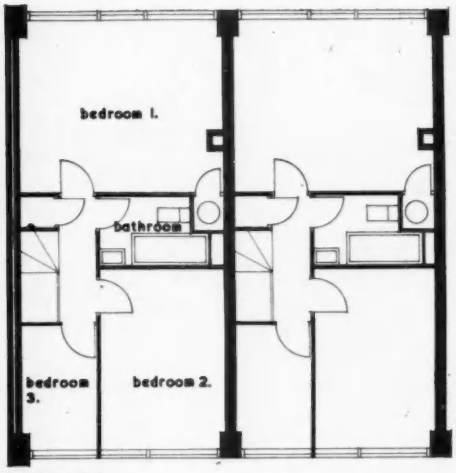
The bathroom is planned in the centre of the house so as to utilise main external walls for habitable rooms. It is lit by a high level window in the roof.

Construction is 9 in. brick crosswalls at 15 ft. 9 in. centres, with timber framed infill walls at front and rear clad with horizontal hardwood boarding and metal windows. To reduce the apparent height, the roof springs from window cill level, and dormer windows are inserted. Purlins span from wall to wall, dispensing with trusses. The houses were retailed at prices up to £4,000 each.



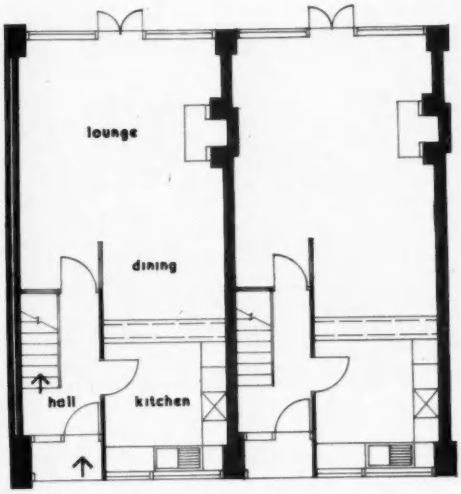


dormer window in bedroom

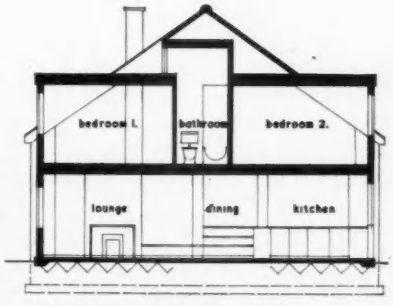


FIRST FLOOR

kitchen and (below) living room



GROUND FLOOR, Scale: 1 in. = 12 ft.



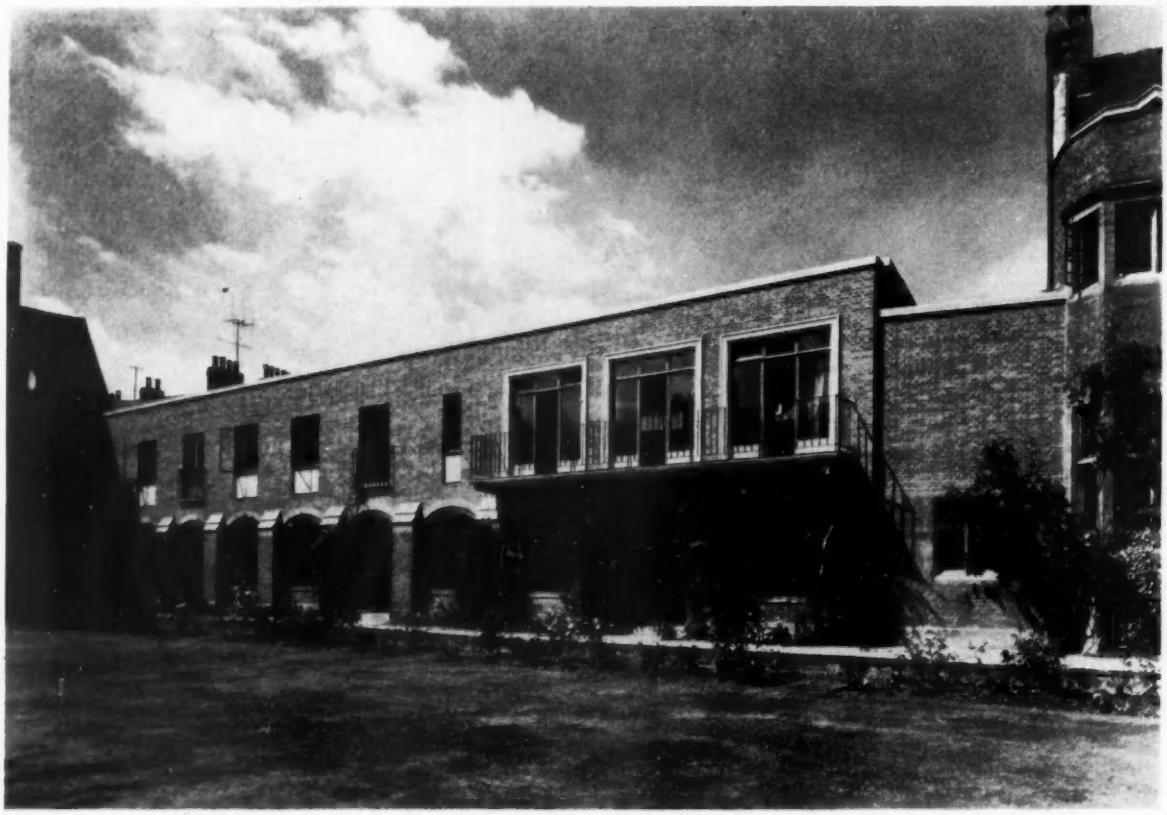
CROSS SECTION, Scale: 1 in. = 16 ft.

Housing at Streatham

Facing page, typical frontage of a house, clad in hardwood boarding

Addition to Westcott House, Cambridge

CECIL J. BOURNE, DIP.ARCH, ARIBA, architect
T. R. L. GIBSON, MBE, structural engineer
COULSON & SON, LTD., general contractors



new extension from the court

WESTCOTT HOUSE, founded in 1881, is a college for training ordinands for the Church of England. It is built on land belonging to Jesus College and is sited opposite the main gate to that college.

The north range of buildings fronting Jesus-lane was designed by Grayson & Ould and erected in 1899, with additions of the west range by Hartwell Simpson in 1912. The south part of the east range of buildings facing the court was designed by Temple Moore and erected in 1914, and the remainder of the court was closed in by Morley Horder in 1923, 1926 and 1929.

The old common room sited in the north range fronting Jesus-lane was found to be inconvenient and inadequate for the purpose and Westcott House Council required additional accommodation in the new common room and extra sets of rooms for ordinands.

The only part of Westcott House suitable for development was the narrow tapering strip of land on the west side of the court containing Morley Horder's cloister. It was decided to retain the cloister, which links the dining hall to the library and chapel, and to build over it. The cloister is also continued in the south range giving architectural continuity to two sides of the court, and to destroy it would be unwarranted.

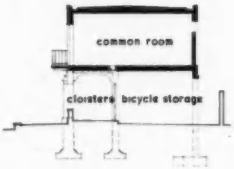
In addition to the common room, two new sets of rooms have been provided together with new gyp, bathroom and storage accommodation. The hall between common room and cloister has been extended to accommodate a new top lit staircase in Hornton stone, with a chair store from the landing which is also top lit.

The common room is wedge shaped with built-in seating on the west wall and built-in book shelves round the main entrance doorway, all in African mahogany. The hardwood strip floor is Muhuhu. Casement doors in the window units open on to a balcony overlooking the court.

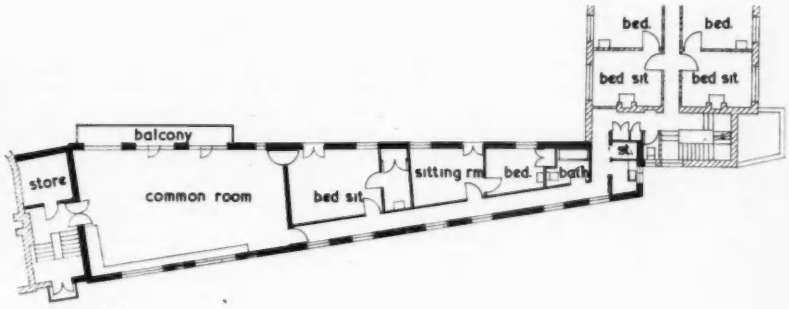
The panelling at the south end of the common room contains two secret doors, one leading into the bed sitting room and one into the corridor. The double doors to the bed-sitting room are normally kept locked and are only used when a temporary stage is erected at the south end of the common room for concerts. The bed sitting room then provides green room and dressing room accommodation. The permanent rail for the stage curtains is concealed in the plaster ceiling.

The existing heating and hot water installations have been extended to serve all new rooms; a Dunham-Bush con-

common room

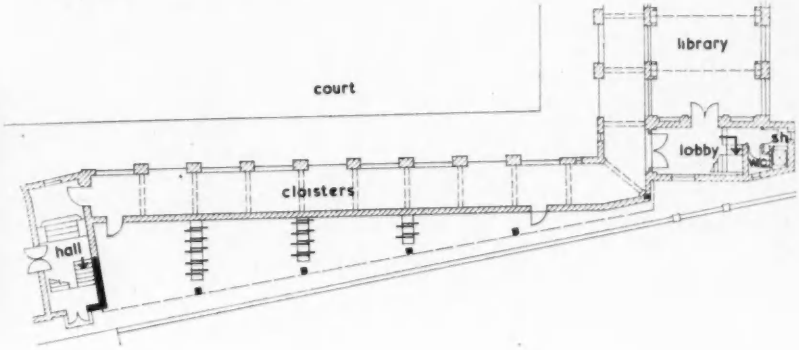


bed sitting room



FIRST FLOOR

GROUND FLOOR, Scale : 1 in. = 32 ft.



common room towards entrance

cealed heater heats the common room and the lighting is concealed in a fibrous plaster trough running round the perimeter of the ceiling.

The facing brick is a 2-in. hand-made multi-red facing brick which blends with the Tudor Court, and all stone surrounds, panels below windows, and copings are Clipsham stonework. Tender figure: £12,826. Final cost approximately £12,000. Quantity surveyors: Lewis & Marshall.

sub-contractors & suppliers:

Reinforced concrete: G. K. N. Reinforcements Ltd.; *bricks and sanitary fittings:* Pratt (Watford) Ltd.; *slate cills:* Bow Slate and Enamel Co.; *metal windows:* Mellowes & Co. Ltd.; *w.i. and bronze balustrading:* George Lister & Sons; *plasterwork:* G. Cook & Sons Ltd.; *stonework and joinery:* Coulson & Son Ltd.; *electrical:* Wilson Heating & Electrical Co. Ltd.; *pavings and stair treads:* Hornton Quarries Ltd.; *door furniture:* G. K. Neale Ltd.; *hardwood strip and plastic flooring:* Holmes (Norwich) Ltd.; *copper roofing:* T. R. Freeman & Son (Cambridge) Ltd.; *roof lights:* Lenscrete Ltd.

More Everyday Things

BY ARTHUR W. KENYON, CBE, FRIBA

59. Let the People Pass

I WOULD LIKE to place it on record for whatever history may be writ, that on the third day of August in the year of Our Lord 1961, the common citizenry of London passed through the central opening of Marble Arch without let or hindrance for a period of five minutes full, timed by the watch on my wrist. Unto this statement I set my hand and seal.

The gates which normally obstruct the opening had been taken away by workmen in the course of constructing the new road, thus leaving a free passage through the Arch. Almost before they knew what was happening they had lost possession of the way and streams of people were walking through, dodging builders' equipment, barrows, poles and planks, forming obstacles in their path. Actually it proved a short cut to nowhere, for when the surging masses, thinking to get to their bus stops by a quick route, finally reached the road on the other side, the one-way non-stop traffic was hazardous to cross. Nevertheless, taking their lives in their hands, they managed to dodge through without accidents and the stream through the Arch continued.

As I watched the scene fascinated, I recalled that I once drove my car through Marble Arch, whether through ignorance or stupidity I do not now remember, but I know that busmen gesticulated and pedestrians waved their arms. The Arch was sacred, to be used only for royal processions or for the Royal Horse Artillery on their ceremonial route to fire the guns in Hyde Park on a day of royal salute. But in those days policemen were not so thick on the ground as they are today; there was no officer of the law to witness my misdeed and I got away free. But on August 3, 1961, the strong arm of the law took exactly five minutes to restrain the offenders, and the route was then cordoned off.

The incident interested me, if only as proof (if proof I needed) that people will always take a short cut between any two points when they travel on foot, no matter how hazardous the route may be, and they will always resist any attempts to direct them into more circuitous paths, albeit the direction is intended for their protection and safety. Once again I am thinking of the giant subways which are being constructed at enormous expense as pedestrian ways where traffic is thick. I wonder very much whether they will ever be used by more than the few. The motorist has been brought up on a highway code; it is a condition of his licence that he obeys it and as soon as he steps into the driving seat he automatically assumes a frame of mind in which he conforms to the rules. But when he steps out of his car he is a pedestrian again, and on foot he feels traditionally free to move as he pleases, whatever the hazards. I suspect it will take all Mr. Marples' wiles to lure the foot-loose and fancy-free into his tunnels.

Clean Air Conference

Report on Pollution Survey

THE TWENTY-EIGHTH annual conference of the National Society for Clean Air is to be held at Brighton from October 4 to 6. The conference will be opened by the Parliamentary Secretary to the Ministry of Power, Mr. John George, CBE, MP. The society's new president, Lord Cohen of Birkenhead, Professor of Medicine at Liverpool University, will be in the chair. His presidential address will follow immediately after Mr. George's opening speech.

A feature of the conference this year will be a transatlantic telephone discussion between a panel of experts on the platform at Brighton and a panel in New York. The discussion will range over such topics as the health effects of pollution, fumes and smoke from road vehicles, public relations and the clean air campaign, and comparison of the legal and administrative problems in each country.

National Survey of Pollution

At another session there will be a report on the new national survey on air pollution. This Survey is intended to give a truer picture of the air pollution situation than is obtainable by the present measurement organisation. The report will be presented by officers of the Warren Spring Laboratory, Department of Scientific and Industrial Research.

On October 6 Mr. W. F. B. Shaw, of the Warren Spring Laboratory, will present a paper on whole house warming systems, including central heating and new methods. Later the conference will turn to the progress and problems of smoke control areas. A paper will be given by Mr. G. W. Herrick, chief public health inspector of Fulham, as a local authority representative, and another, from the Solid Smokeless Fuels Federation, will be on the supply of smokeless fuels.

An exhibition, which will be held in the Corn Exchange and in an adjacent annexe, will show all the chief methods of securing clean air and fuel efficiency in industry, in the home, and on the roads. The exhibitors will include Government Departments, national research and industrial associations, and private firms. Full particulars of the conference and exhibition are available from the National Society for Clean Air, at Field House, Breams Buildings, London, EC4.

Letter to the Editor

Windowless Laboratories

SIR,—In 'The Builder' of September 1 is illustrated a school laboratory block which was windowless and this was put forward as a new concept in this class of building. But before this should become too established I would plead that the following factors be given more consideration:

1. Windowless rooms have a grave disadvantage in that the inhabitants' eyes are focused at short range all the time with no possibility to relieve them by the occasional glance out of the window. This is especially so in relatively small rooms with low ceilings, though with large factory open spaces and higher ceilings this condition is not so acute. People working in these conditions tend to become tired and restless and get headaches.
2. Wall space in laboratories, libraries, gymnasia, etc., is always a fight between windows and equipment, but surely the good working conditions of the inhabitants should come before the equipment.
3. If people are distracted by looking out of windows then this also applies to offices, classrooms, etc.
4. Lastly, there is the extreme difficulty of overcoming down-draughts from rooflights and natural ventilation is also difficult.

In America factories have been erected completely windowless and with full air-conditioning and have been failures because the human element has not been considered.

H. CULLERNE PRATT [ARIBA, AMTPI],
399-401 High-street, Stratford, E15.

Appointments

MR. G. L. PLASTOW, MIMUNE, engineer and surveyor, Wolverton UDC, Buckinghamshire, has been appointed engineer and surveyor, Cookham RDC, to succeed Mr. A. Mandeville, BSc, MIMunE, who has been appointed engineer and surveyor, Neath RDC.

MR. L. N. PEAKE, maintenance works manager, Rotherham rural council, is to take charge of the authority's housing department and housing estates maintenance.

News of the Week

Architecture in Transport Exhibition

THE BRITISH TRANSPORT COMMISSION'S exhibition 'New Architecture in Transport,' which was on view to the public in London recently, will be re-staged at Messrs. Owen Owens department store at Coventry from September 18-28 at the request of the store management. The exhibition will be officially opened by Mr. Arthur Ling, City Architect and Planning Officer, Coventry, at noon on September 18.

Comprising over 60 examples of designs by British Transport architects, the exhibits include provisional schemes for stations in Birmingham and London. Models, drawings, photographs and colour transparencies show a wide selection of projected and completed buildings, including new railway stations, signal boxes, offices, bus stations and laboratories, as well as station refreshment rooms, hotel rooms, ship interiors and furniture.

RICS QS Examinations

ON JULY 17, 1961, the Quantity Surveyors' Committee of the RICS received the report of the Education and General Purposes Sub-Committee, on the subject of the revised structure and syllabus for the Quantity Surveying Section of the examinations. After full consideration, the report was accepted for submission to the Special Examinations Syllabus Committee and to the Council for final approval.

Information about the revised structure and syllabus will be circulated as soon as possible after the Council Meeting in October, 1961. It is proposed that the Quantity Surveying Section of the Examination shall consist of an Intermediate, a Final Part I and a Final Part II Examination, to be taken after two, four and five years respectively.

QS Annual Dinner

THE CHARTERED QUANTITY SURVEYORS annual dinner will be held at Grosvenor House, Park-lane, W1, on Tuesday, November 21 next. By the end of June all available tickets for the dinner had been allocated to those corporate members who applied for tickets and the Committee regret that no further applications can be accepted.

Cambridge University Appointment

MR. E. F. MILLS, ARICS, AAI, AMTPI, has been appointed director of estate management at Cambridge University. He will be head of the estate management advisory service which is taking over the professional activities of the present department of estate management and will be responsible, under the financial board, for the care and maintenance of University sites and buildings, for advising on the purchase and sale of property, and for the management of university property. The Service will perform similar duties for any colleges which may require them, and will also superintend the university's extensive building programme. Mr. Mills will have no responsibility for the teaching side of the present Department of Estate Management, which will continue under the board of estate management, with Mr. D. R. Denman as head, but it is intended that there should be close co-operation between the teaching department and the advisory service.

Site for Durham University

THE KING'S COLLEGE DIVISION of Durham University is to purchase a site near the new physics building to carry out its plans for redevelopment. It is understood that a price of £140,000 has been agreed with Newcastle Corporation for Haymarket House, which includes the Haymarket Cinema, a bank, and a restaurant. The purchase will be completed with the aid of the University Grants Committee. The corporation has made a compulsory purchase order on the site to ensure its zoning for university development, but it is unlikely that any rebuilding will take place within the next few years.

Minister's Decision on Leighton House

MR. HENRY BROOKE, the Minister of Housing and Local Government, has decided not to confirm a building preservation order in respect of Leighton House in Holland Park-road, Kensington, London, W8, the nineteenth-century home of Lord Leighton. In this decision the Minister has gone against the advice of his inspector, Mr. J. R. M. Poole, which the latter submitted after a local inquiry in April into objections to the preservation order by the Kensington Borough Council. The council opposed the order on the grounds that the property was not of sufficient architectural or historical interest to warrant such a procedure.

'No Frenchman can fish from a tunnel!'

A Hundred Years Ago

From The Builder of Sept. 14, 1861

PAPER FROM WOOD.—It is said that a French lady has succeeded in manufacturing excellent paper from wood, at a price much lower than that from rags. Her method, according to the *Mechanics' Magazine*, consists chiefly in the use of a new kind of machinery for reducing the wood to fine fibres, which are afterwards treated with the alkalis and acids necessary to reduce them to pulp, and the composition is finally bleached by the action of chlorine. Paper made according to this method, from wood, and which costs only 400 francs (£16) per ton, is said to be esteemed by engravers and lithographers as being quite equal to the China paper, which costs 5,350 francs (£214) per ton.

OFFICES AND SUPERMARKET, WIMBLEDON.—*A perspective of the 8-storey shop and office block which Ronald Lyon Construction Ltd. are building on Wimbledon Broadway for London and Provincial Estates Ltd. The air-conditioned ground floor will comprise one of the largest supermarkets in Britain, the tower block has been let as offices and the first floor over the supermarket will become the new headquarters of the Lyon Group. The architect is Mr. Geoffrey Mills, ARIBA, chief staff architect of Ronald Lyon (Estate) Co. Ltd.*

Competition News

University Campus, Liverpool

LIVERPOOL UNIVERSITY is proposing to hold an architectural competition for a campus for 2,000 men and women students. The assessors will be Mr. D. E. E. Gibson, CBE, FRIBA, Professor H. Myles Wright, MA (Cantab), FRIBA, of the Department of Civic Design, Liverpool School of Architecture, and the Vice-Chancellor. The total amount of premiums will be £5,000. Full details and conditions will be issued at the beginning of October.

St. Paul's Choir School

THE FOLLOWING six firms of architects are invited to take part in the limited competition, organised by the Minister of Housing and Local Government, for designs for the new St. Paul's Choir School to be built on a site at the eastern end of St. Paul's Cathedral:

Architects' Co-Partnership; Raymond Erith, ARA; Howell, Killick & Partridge; Robert Matthew & Johnson-Marshall; Lord Mottistone (Seely & Paget); and Stillman & Eastwick Field.

The assessors (who will have the assistance of the Archdeacon of London, representing the Dean and Chapter of St. Paul's, who administer the Choir School) are Sir William Holford, PRIBA, Professor Llewelyn Davies and Dame Evelyn Sharp (Permanent Secretary, MoHLG). Designs are called for by February next.

Coming Events

SATURDAY, SEPTEMBER 16

BBC (Third Programme).—'Both Heaven and Hell'—a Conversation between Lewis Mumford and Graeme Shankland. 9.15 p.m.

MONDAY, SEPTEMBER 18

BTC.—Exhibition: 'New Architecture in Transport.' Messrs. Owen Owens department store, Coventry. Opening by Mr. A. Ling, City A & Planning Officer (until Sept. 28).

TDA.—First International Conference on Timber Engineering. Southampton University. 2.45 p.m. (until Sept. 23).

WEDNESDAY, SEPTEMBER 20

THE INTERNATIONAL CARAVAN EXHIBITION.—Earls Court, London. 10 a.m. to 9 p.m. daily until September 30.

LONDON BUILDING & ENGINEERING CONTRACTORS ACCIDENT PREVENTION GROUP.—'Safety and Health in Compressed Air Working,' by Dr. P. D. Griffiths. Industrial Health & Training Centre, 97 Horseferry-rd., SW1. 2.30 p.m.

FACULTY OF ARCHITECTS & SURVEYORS.—London reception. 68 Gloucester-pl., W1. 6.30 p.m.

FRIDAY, SEPTEMBER 22

FACULTY OF ARCHITECTS & SURVEYORS.—Week-end Study School. Jesus College, Oxford (until Sept. 24).

SATURDAY, SEPTEMBER 23

LONDON BUILDERS' FOREMEN'S ASSOCIATION.—Annual ladies' festival. Connaught Rooms, Gt. Queen-st., WC2. 5.30 p.m.

HIGGS AND HILL LTD.—Annual apprentices' supper.' Ardington Rooms, Clapham, SW4. 7 p.m.

Mumford on the Air

LEWIS MUMFORD will join with Graeme Shankland in a conversation on the BBC Third programme on Saturday night, September 16. The feature is entitled 'Both Heaven and Hell.'

Book Review

The Construction of Gothic Cathedrals

THE CONSTRUCTION OF GOTHIC CATHEDRALS. A Study in Medieval Vault Construction. By John Fitchen. XXII +344 p.p.+73 illus. (Clarendon Press. Oxford UP 1961.) Price £3 3s. net.

FROM TIME TO TIME books appear which, by their authoritative presentation of newly discovered information, become, as it were, milestones along the road to knowledge. They may lengthen the journey but they bring us nearer to our destination. The 'Recueil,' of Mortet and Deschamps, and Salzman's 'Building in England,' were books of that kind. John Fitchen's 'The Construction of Gothic Cathedrals' is another important book; important not because it adds essentially to our knowledge—after reading it we remain substantially in our present state of ignorance—but because it asks percipient and pertinent questions which, however surprising it may seem, have not been asked before. Important, too, because by careful and critical examination it demonstrates the unlikelihood, and in some instances the sheer impossibility, of assumptions which have long been credulously held.

This book is principally concerned with the great masterworks of the 'Ile de France' and the central question it asks is both simple and momentous. How were these great medieval cathedrals built? Above all, how were the vast nave vaults constructed? The immediate and negative answer is that we do not know. Here is a wide field for exploration and research, one would say of primary value to the historian of architecture, which yet lies, apart from a few sporadic attempts to probe the surface, virtually fallow.

Preserved records and account rolls tell us what materials were used but contemporary information on how they were used, on the technical processes employed, is seemingly impossible to come by. This is not altogether a matter for surprise in view of the deep secrecy maintained by medieval guilds about the 'mysteries' of their crafts; to commit these 'mysteries' to writing, for all to read, would have been akin to treason. Available knowledge does, however, furnish certain facts and conditions which must form the inevitable context of future inquiry.

Transport was a major problem in medieval building. Masonry was in relatively small units, although large stones, as for a 'tas-de-charge' or the crownstone of a wide vault, were occasionally required. Mortar was lime-mortar but little is known of its composition—analysis would be informative, but it is possible that clay was added to accelerate the setting. Constructional timber to the medieval carpenter meant oak, and oak, in all but the rarest instances, meant green oak. There was, however, a considerable trade in Estrick timber (i.e. Eastern or Baltic) and it is reasonable to suggest that the lighter deal, in preference to the heavier oak, was used for the necessary falsework of arches and vaults.

Graphic presentation of solid geometry would have been of little use to medieval builders even if, which is doubtful, they had been capable of producing it. The stresses and strains of their great buildings, as well as the complicated details of their construction, were in all probability studied and explained by means of models; the details themselves, at their point of realisation, being set up to full scale on tables or a levelled floor. It is against a background of such considerations, and others like them, that future inquiry into the techniques of medieval building construction must be conducted.

The difficulties confronting the builders of a rectangular ribbed quadripartite vault are explained at length and with clarity. The principal purpose of the ribs was to facilitate the construction of the webs, or infillings; to mask the discrepancy in the web joints as between the smaller and larger spandrels; and to give visual emphasis to the vault shape. Whilst it is clear that the construction of the diagonal ribs and side arches presented technical problems, and that these problems would increase in difficulty with the height and size of the vault, the ribs and arches themselves were of simple geometric form. This is not so in the construction of the web, or infilling, and it is here that the greatest structural difficulty is encountered.

Assuming a usual arrangement of a rectangular vault with two semi-circular diagonal ribs and four pointed side arches rising to about the same height as the crown of the ribs, a geometric projection of the contour of the diagonal rib to the side wall would be an ellipse. The pointed side arch consists, however, of two segments of a circle. It is clear, therefore, that the surface of the web, or infilling, spanning from side arch to rib, if it is to fit the contours of both, will be deflected or deformed from a geometric projection of one or the other arch form. This deflection produces what is generally described as a 'ploughshare twist.' Add to this that it was the practice of the medieval mason to secure ultimate rigidity in the web by giving it curvature in two directions, in other words by giving it a domical form, and it will be seen that the constructional difficulties were indeed formidable.

The author directs his inquiries to the structural means by which the amazing 'tours de force' of medieval cathedral building were achieved. His partial and not entirely convincing answers remain, for want of corroboration, as hypothetical suggestions. These inevitably raise a series of further questions, pointing to a wide lacuna of obscurity in our knowledge of medieval building practice, and only to be precisely answered—if they can be answered at all—by further and prolonged research.

JAMES BURFORD

Work by Private Architects

New Commissions Fall for Second Quarter in Succession

THE ESTIMATED TOTAL VALUE of new commissions for private architects has fallen for the second quarter in succession. The actual figures for the period April/June, 1961, were £253m. compared with £282m. in the first quarter of the year and £271m. in the same period a year ago. This represents a fall of 10 per cent over the first quarter of the year and of 7 per cent over the second quarter of 1960. Since tender prices have risen in the past year and architects have presumably taken some, if not full, account of this in their estimates of the value of new commissions, the actual volume of new building commissioned compared with a year ago has probably fallen by 9-10 per cent rather than the 7 per cent shown in Table 1.

The second quarter of the year normally shows a fall in relation to the first quarter and the current position is not a major decline; in 1959 and again in 1960 the second quarter showed a fall in relation to the first quarter of 17 per cent and 25 per cent respectively. Nevertheless, this is the first time since the middle of 1958 that two successive quarters have shown a fall in the total value of new commissions; it strongly suggests that the boom in new commissions ended with 1960 and that a period of decline has now set in. The policies announced by the Chancellor on July 25 will of course have a further depressing influence on decisions to build, and although most offices are still very busy, architects must hope that it will be possible to encourage investment again before the present stock of projects is worked off.

The detailed figures shown in Table 2 show the pattern of changes among the different types of building. Commissions for public authorities have risen to £82m., 19 per cent above the figures for the first quarter of the year and 14 per cent above the same period in 1960, and within this total, commissions for public housing at £22m. are back to a high level. Commissions for private clients have, however, fallen sharply to a total of £171m., 20 per cent less than in the first quarter and 14 per cent below the level for the corresponding period of 1960.

The Survey results for the first quarter of the year showed that public authority commissions had fallen (compared with the first and last quarters of 1960), and private commissions, excluding Housing, had risen a little. (Housing, which was far below the figures for the last quarter of 1960, had pulled the total of private commissions into an overall fall.) The partial reversal of these trends in the April/June quarter suggests that public authorities were able to start all of their 1960/61 programmes well before the end of that year and have now made a vigorous start on their programmes for the next financial year; and that the decline in commissions from private owners and developers, which started last quarter in housing, is now spreading.

Private housing, at £48m., shows the lowest quarterly total since mid-1958 and it now seems likely that speculative house building has been sharply cut back. Commissions for private offices and banks have also fallen sharply, being now only a half of what they were both last quarter and a year ago. These are the groups in which most speculative building falls, though they include also a considerable amount of building for the sole occupation of the building owner. These reductions therefore suggest that plans for speculative property development as a whole were tending to decline during the second quarter of the year.

Commissions for other commercial and miscellaneous buildings (a very heterogeneous group which includes shops and warehouses, hotels and agricultural buildings, as well as churches and social buildings of all sorts) have fallen also but are still above the general level for 1959 and 1960. Only private commissions for industrial building have held their own, with a moderate rise over the estimate for the first quarter of the year.

The Regional Position

The Regional position is shown in Table 3. All Regions except the South West have suffered a fall in total commissions, the sharpest reductions, of approximately 25 per cent below the first quarter's figures, occurring in the Home Counties, the Midlands and Scotland.

Large firms have lost more ground than the small and medium firms this quarter. Compared both with last quarter and with the corresponding period a year ago, the estimated value of new commissions for large firms (firms with 11 or more architectural staff) is 15-20 per cent less. It is noticeable that within this overall reduction the large firms have suffered a more than proportionate reduction in new commissions for private housing. The small and medium firms appear to have held their position.

In value terms the ratio of cancelled or postponed work to all new commissions was 1:14, less than in the first quarter of the year when the ratio was 1:10.

TABLE 1.—ESTIMATED VALUE OF NEW WORK FOR WHICH PRIVATE ARCHITECTS WERE APPOINTED

QUARTER	1959 £ m.	Change over previous quarter %	Change over same quarter of 1958 %	1960 £ m.	Change over previous quarter %	Change over same quarter of 1959 %	1961 £ m.	Change over previous quarter %	Change over same quarter of 1960 %
First	267	+41	− 5	361	+34	+35	282	−14	−22
Second ...	222	−17	− 2	271	−25	+22	253	−10	− 7
Third ...	225	+ 1	+60	276	+ 2	+25			
Fourth ...	270	+20	+42	329	+19	+22			

TABLE 2.—NEW COMMISSIONS FOR PRIVATE ARCHITECTS ANALYSED BY TYPE OF BUILDING

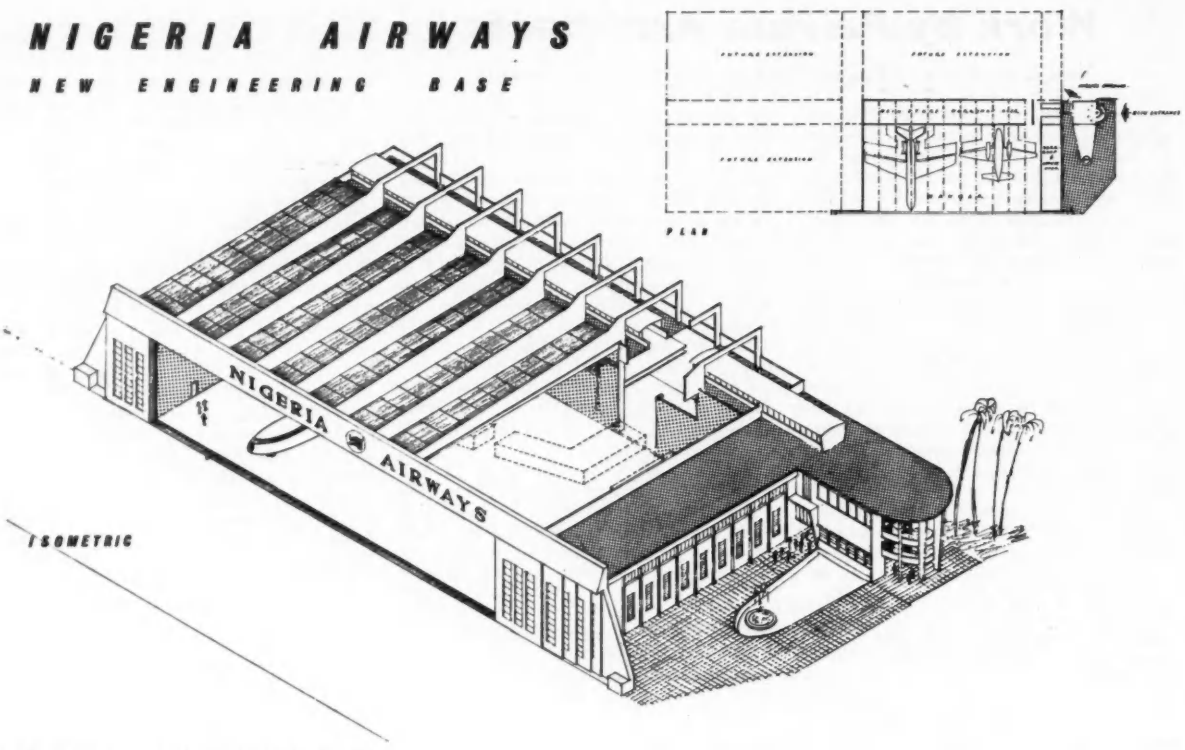
(£ million)

Type of Building	Quarters of 1959				Quarters of 1960				Qtrs. of 1961	
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd
NEW HOUSING :										
For public authorities	17	28	13	13	18	17	33	16	13	22
For private owners and developers	77	57	68	74	108	554	67	107	62	48
	94	85	81	87	126	71	100	123	75	70
OTHER NEW BUILDINGS :										
Private industrial building	46	32	30	55	54	54	36	39	39	43
Private offices and banks	21	14	15	31	20	37	24	31	36	18
Other commercial and miscellaneous buildings for private clients	63	37	41	38	54	46	57	37	61	54
Educational (public and private)...	26	34	23	27	56	31	27	44	38	31
Other buildings for public authorities	17	20	35	32	51	32	32	55	33	37
TOTAL, NEW COMMISSIONS	267	222	225	270	361	271	276	329	282	253
For public authorities	53	65	61	61	110	72	80	88	69	82
For private owners and developers	214	157	164	209	251	199	196	241	213	171

TABLE 3.—NEW COMMISSIONS FOR PRIVATE ARCHITECTS ANALYSED BY REGION, BASED ON THE LOCATION OF THE ARCHITECT'S OFFICE

(£ million)

Region	Quarters of 1959				Quarters of 1960				Qtrs. of 1961	
	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd
London and Middlesex	117	79	102	103	128	114	101	126	104	98
Home Counties	32	21	33	26	59	28	40	39	42	31
South Western	14	14	11	15	24	11	22	27	17	24
Midlands	27	27	22	31	39	41	27	28	31	24
North Eastern	24	27	22	30	38	22	35	47	33	27
North Western	23	25	23	33	42	19	19	31	30	28
TOTAL, ENGLAND...	237	193	213	238	330	235	244	298	257	232
SCOTLAND	25	23	7	26	22	28	27	23	20	15
TOTAL, GREAT BRITAIN (Inc. Wales)	267	222	225	270	361	271	276	329	282	253



SCALES : ISOMETRIC : 1 in. = 80 ft. PLAN : 1/2500

Airline Engineering Base, Nigeria

Lagos Scheme for Nigeria Airways

EARLY in 1961 Mr. R. A. Rathbone, MA, BArch, ARIBA, in conjunction with the consulting engineering firm of Hedley S. Crabtree & Company Ltd., submitted an outline scheme to Nigeria Airways Ltd. for a new engineering base to be built at Ikeja Airport, Lagos, Nigeria. This was done in view of the crucial need for adequate servicing facilities for an expanding airline.

As all efficient airlines know, economic success in the field of air transport depends, in the first instance, upon the development of the highest possible efficiency in an airline's engineering department, and the potential efficiency of an airline's engineering department depends to a very large extent upon the layout and facilities offered by engineering base buildings.

The problem of layout of such a base is not an easy one. In the first place it has to be recognised that constant growth is to be expected for an efficiently run airline, almost as far into the future as can be seen. At the same time it must be borne in mind that any new engineering base built by an airline must be economic in use from the moment the building is put into use; this means that a layout must embody all facilities required initially, but it must also be designed so as to allow the whole of the facilities, or parts of the specialised facilities, to be expanded progressively by building extensions at periods of time in the future, without breaking up or disorganising the work of the base whilst these extensions are being built. This in turn demands that the original layout shall be such that the most economic methods of work-flow, and work-control through the hangars, stores, specialist shops, and controlling offices, shall obtain in the original building. Any future extensions must neither break up these economic features, nor cause disruption by a need for alteration if and when extensions are built.

Problems of Air Conditioning

In the layout developed for Ikeja Airport it was necessary not only to consider the points outlined but also to consider local conditions peculiar to Lagos. In order to give a good working environment it was necessary to design a building which would lend itself to various degrees of air conditioning throughout. In certain specialist shops full atmospheric control of humidity, cleanliness and temperature was required, whilst at the other end of the air conditioning scale in the hangars only a small drop in ambient temperatures was required to improve working conditions to efficiency level.

Some idea of the volumes to be tackled in the initial building can be gauged from the fact that specialised full control would cover a volume of 12,800 cu. ft. of offices and workshops, whilst intermediary air conditioning control in other less critical areas would be required for 32,000 cu. ft., and a mere temperature drop would be required for 1,024,000 cu. ft. In order to keep down the running costs of the air conditioning equipment natural insulation of the building itself would have to be considered. Apart from their effects upon human beings the atmospheric conditions found in the coastal belt of Nigeria are notorious for their corrosive abilities in which they are assisted by fungal and other growths as well as the depredations of termites.

In conjunction with all these problems it was felt very strongly by the architect that the greatest possible use should be made of locally available building materials as well as the greatest possible use of local skills and crafts. The drawing illustrates a further and more detailed development of the original skeleton scheme submitted to Nigerian Airways. It represents a prototype for a successful economic unit capable of progressive expansion to meet the needs of any growing airline.

Appointment

NEWPORT (MON.) COUNCIL have appointed Mr. F. L. McIntosh, chief planning assistant in the town, a new position. Mr. McIntosh, who has had planning experience at Liverpool and Formby, joined Newport council in 1950. The council decided to create the post of planning officer because the borough engineer, who had been in control of planning for the past few years, is due to retire.

Education for the Architectural Profession

President's Address to Berks, Bucks and Oxon Architects

THE PROBLEM of education for the architectural profession was chosen by MR. DAVID BEECHER, MA, FRIBA, President of the Berks, Bucks and Oxon Architectural Association, when he addressed the Association's annual general meeting on May 6. Following are the main points from Mr. Beecher's remarks:

'Use your eyes, use you ears, and above all, gentlemen, use your loaf.' I must apologise for those opening words, and also explain. I have quoted the sentence with which a medical specialist began an address to a gathering of doctors. I was told that doctors, in a group, are the stickiest people on this earth, but sometimes, in the light of various experiences thrust upon me during the past two years, I wonder if we architects cannot, of right, claim that distinction, at any rate when we get onto the subject I have chosen—education for the profession.

During the past two years the RIBA Council have dealt with various matters of importance and a start has been made on education. It is to be hoped that a decision on this most important subject will be made during the coming session. It is my belief, first, that an early decision is vital; second that on this decision the future status of the profession in this country may well stand, or fall.

You will have seen or heard various views expressed—I would like to have said argued, but I have found little attempt to develop an argument in the proper sense of that word: 'A connected series of statements intended to establish (or subvert) a position; a process of reasoning.' We have had some good sense but also a spate of catch-phrases; 'diluting the profession,' 'half-baked architects,' 'two tiers,' 'poor relations' and so on. As Mr. G. L. Bayliss, who described himself as 'a rather weary and aged schoolmaster,' said as long ago as 1957 (in a letter to 'The Times'): 'There is more bilge, balderdash, bunkum and blather uttered upon education by those who should know better, than upon any other subject under the sun.' A rather weary and aged architect is now attempting to avoid such strictures and to offer, for your consideration, some connected statements on basic principles in the hope that, when the matter is referred to the Allied Societies, they may assist in developing a sound argument.

A Legal Definition

Before we can begin to consider this question of education—or training which, for our present purpose, amounts to the same thing—we need to know for what we have to train. In other words; what is an architect? Lest this question should sound frivolous, or worse, let me quote a legal definition from Halsbury's Laws of England, for which I am indebted to Mr. Anthony Clark, president of the North Wales Architectural Society.

> '. . . a person who possesses, with due regard to aesthetic as well as practical considerations, adequate skill and knowledge to enable him (1) to originate, (2) to design and plan, (3) to arrange for, and supervise the erection of such buildings, or other works calling for skill in design and planning as he might, in the course of his business, reasonably be asked to carry out, or in respect of which he offers his services as a specialist.'

It is hardly an exaggeration to say that the realisation that that is what one is—or should be—is somewhat frightening. Perhaps it adds point to a notice which hangs on an office wall at 66 Portland-place: 'Think, it may be a new experience.' It certainly suggests that those who will be responsible for the training of future architects have a heavy responsibility.

As this century has been slipping by, the complexity of building has been increasing with ever growing rapidity; new materials, new methods of construction, new functions, new requirements, spreading over wider and wider fields. The architect is, or should be, the building leader. If he is to maintain—perhaps I should say regain?—this position, architectural practice will have to develop along with, and keep one step ahead of, building practice. Consider a few random items: the pile foundations on that made up site; the steel or reinforced concrete framework; the sizes and spacing of the pipe coils in the floor; the dimensions of those ventilating ducts which trail around the building; the exclusion of noise from the adjoining railway or main road; the absolutely even level of artificial lighting which is so essential in Room 23.

The Architect as Specialist

The list is inexhaustible, but man's brain is not. And yet, we are told, the architect is required to offer his services as 'a specialist.' Since no one architect, 'be he never so wise or prudent,' can ever hope to possess that 'adequate skill and knowledge' to be master of every facet and technique of modern building, he will, I submit, be wise to consider very carefully the realities of his capabilities, and of his limitations, remembering the extent to which he already relies on consultants, whether they be formerly appointed as such or the commercial firms from whom he obtains, without obligation, designs and estimates. In other words, the master architect who knew it all is a dead relic of the past; the sooner he is buried, the better.

The age of the successful, because possible, architectural Jack-of-all-trades having passed away, the architect of today—and even more so, of tomorrow—finds, as a result of his inescapable limitations, that he can only fulfil his proper function by increasing reliance on others, so it is particularly important to discover and realise just what his real job now is. He likes to think of himself as a leader and surely that is what he should be; the leader of the building team which comprises his own staff, the consultants, the specialists, the sub-contractors and the general contractor; and what is more, a specialist himself. A specialist in what?

Legally he is required to originate, design, plan for and supervise the erection of buildings; so the wheel has come full circle and he has, after all, to be a Jack-of-all-trades, but in a very different sense. For want of a better description I define the architect's primary function as that of 'overall designer.' By this I mean that he should have, in equal measure, the aesthetic skill to originate and design a building as an entity, and also knowledge of practical, constructional skills sufficient to enable him to understand and criticise such of these as are involved in the building, and so weld together the detailed specialisation carried out by others, both in his own office and outside it, thereby producing the good architecture which it is his prime function to conceive, and see executed.

Conducting a Symphony

He might be likened to the conductor of an orchestra (or leader of a quartet). He directs and controls the whole operation; has sufficient knowledge of each instrument to ensure that it performs its proper part; and he is responsible for the whole. Yet, although he may be able to play one or more instruments, he accepts the fact that he is not as good a violinist, say, as the leader of the violins; he realises that alone, without his orchestra, he is powerless to produce a symphony; and when his efforts are applauded he acknowledges this fact by insisting that the whole orchestra stand up with him.

If the argument thus far is accepted—and I can find no escape from it—then implications follow which are fundamental both to the training of the architect and to the organisation of his profession. As to training, this is based on, since it follows, general education which, at present, leaves much to be desired. Fortunately the nonsense innate in the eleven-plus exam has been realised and educationists are beginning to re-discover the true meaning of the verb 'to educate'; 'to lead forth; to nourish; to bring out.'

According to an ancient Indian fable 'We cannot change the character of those whom Nature has made. . . .' Whether we are dealing with architect, lawyer, doctor or thief, education can only make him really good at his job if he has the makings of his chosen calling born within him. For proof of this you have only to use your eyes to look at the buildings of this age; you will find ample evidence that there are too many qualified architects, products of our educational systems, who lack the aesthetic and/or practical skills which the architect should possess, and some who possess such skills outstandingly.

If the demand for an improvement in the standard of architectural design is to be met, it can only be done by eliminating the know-all lone practitioners, striving hopelessly to live the past in the present and restricting the designing of buildings

to those who have the qualities essential to the successful execution of such work, to truly qualified 'overall designers,' the architects of the future, leaders of teams.

Conclusions

On this basis the need is first for a broad general education, the broader the better, designed to seek out and develop the innate qualities in each individual child, and avoiding the specialisation inherent in 'A' levels until such time as those qualities are unmistakenly known (and they may not come to light before the student is in his twenties). Then, if those qualities point to architectural practice, further education, the education of the architectural practitioner—I have deliberately avoided the words architect, technician, technologist—designed to bring out and develop in each man his specialised qualities and enable him to qualify for his appropriate part in architectural practice. He may not become an architect in the sense of 'overall designer' but can nevertheless be equally important as one of those upon whom such an architect has, of necessity, to depend; one, in fact of the team of inter-dependent and equally valuable architectural specialists which modern building practice makes inevitable.

To return again to the Indian fables, 'No one, be he never so wise or prudent, can escape his destiny.' If the destiny of our profession is to be what we hope for it, it is my belief that it must face facts, accept them, and then be both ready and willing to throw overboard even the most cherished ideas if they be found incompatible with the world in which we live today. This poses no mean problem, and I have but touched upon some points of basic principle which I believe to be essentials of sound foundations for both architectural education and architectural practice, just as sound foundations are essential to any and every building.

Value for Money

Aspects Affecting the Long-Term Value of Dwellings

In a paper submitted to the Housing Centre Annual Conference at the County Hall, London, on June 22 Mr. J. L. Womersley, FRIBA, MTPI, the Sheffield city architect, considered some of the fundamental aspects affecting the long-term value of dwellings. The speaker pointed out that in terms of value for money the smallest possible dwelling could be a very poor investment. Important points emphasised were flexibility of plan, space requirement, a more intensive rationalisation of building methods, and the need for more research and closer co-operation between principals.

IT IS PERHAPS worth while to remind ourselves of what has most contributed to the obsolescence of the housing we are replacing today. Unfitness, as every sanitary inspector knows, covers a variety of defects, but the one which is invariably quoted is 'by reason of bad arrangement' which, being interpreted, means a lack of space both within the building and without. Unfitness, therefore, includes not only the individual dwelling but the whole street and the neighbourhood.

Structural defects, mainly brought about through gross neglect, are also common, but it really is extraordinary how many dwellings have stood, often for a hundred years, with theoretically inadequate foundations, with party walls 4½ in. thick block-bonded to the 9 in. front and rear walls, with the original joinery unpainted for decades and even without damp-proof courses. It is equally extraordinary how many present-day tenants have turned these defective structures into bright cheerful homes. The greatest cause of obsolescence, therefore, has been inadequate space—that vital commodity which can so rarely be added later.

There can be little doubt in our minds now that the standards of space laid down in the Dudley Report of 1944 were at that date both adequate and far seeing. Had we, throughout the last 15 years, been able to build to these standards there would have been little wrong with our post-war dwellings. Unfortunately, because of the unforeseen and unprecedented continuing rising costs, these standards have been gradually whittled down to a point which everyone has now realised is rock bottom so that, rising costs or not, the pendulum must be allowed to swing the other way.

One fundamental point about the economics of space should be clearly understood. It is that once certain costly basic features in a dwelling have been provided—staircase, bathroom, kitchen—the cost per square foot of additional living space is considerably less than the cost per square foot of the dwelling as a whole. In terms of value for money, therefore, the 'smallest possible' dwelling can be a very poor investment indeed.

Basic Needs and Flexibility

Strong contradictory views can be heard as to the sort of dwellings which should be built: on the one hand that homes should be sufficiently flexible or expandable to provide for a family throughout early married life, for the years in which the children are young and adolescent, and during late married life when the children have departed—almost from the cradle to the grave; on the other hand that the provision of a carefully calculated distribution of dwelling types and sizes in each area would enable families to move from one dwelling to another as their requirements change.

There can be little doubt that the right course is to steer somewhere between these two extremes—to provide a variety of dwelling types in each estate and allow for flexibility in at least some of the dwelling types themselves. Despite the mobility in relation to people and jobs which now exists, there is a considerable period in the life of a family with children when from many points of view stability is highly desirable, particularly in the interests of the youngsters. This period may roughly be said to run from the immediate pre-school years of the oldest child until the youngest one leaves the grammar or secondary modern school to go to university, to college or to work. This, according to whether there be one, two or three children would normally cover a period of some fifteen to twenty years. Whilst there will always be a considerable number of families who move by choice during these years, it would seem nevertheless that all family dwellings should be so planned as to provide for the many changes in the needs of the same family during such an important and extensive period.

At either end of this 'middle-life' period, however, it is highly probable that an increasing number of young (childless) and old (childless) married couples will find it more convenient to occupy a smaller dwelling. Two factors indicate that this will become increasingly true—at the younger end the desirability for both husband and wife to go out to work and earn money to build up a home and at the older end the substantial increase in longevity at a time when neither will desire to be compelled to do all the work required to maintain a large family house.

To judge by these trends it seems likely that the number of small dwellings for one and two persons at each end of the middle-life period will amount to something like one-third of the total. The provision for this high proportion of two-person or one-person households in compact, efficient dwellings, many of which can be flats, should enable us to spend rather more money in obtaining more space and greater flexibility in the layout of the remaining two-thirds of four-, five- and six-person family dwellings.

A simple example of this need for flexibility is that of the family with small children who may find it extremely convenient to live in two large rooms—a dining kitchen and a living-room. The small children can be supervised by the mother whilst doing her housework and the frequent meals can be prepared and taken with the minimum of trouble. When the children are bigger and more independent, however, the family may prefer to have a small dining room for meals, a smaller kitchen then being adequate for the reduced activities which will then take place there. If the dividing wall were movable this important change in living habits would easily be made without the family having to move to another dwelling. Clearly, therefore, some simpler method of altering the plan arrangement would be of great benefit in both tenant occupier and owner-occupier dwellings.

Despite much talk about flexibility of plan, little has so far been achieved beyond allowing one room to be opened into another by folding or sliding doors. It would seem that we are for too long allowing the rigidity of heavy structural

internal walls, based on the orthodox design of the traditional brick house, to cramp our style. Schools and offices have thrown this restriction away long ago so that within their external structure completely new allocations of space can be made to suit the changing needs of different occupants during the life of the building. Within the much smaller 'building envelope' of the single dwelling it should be a simple matter (by using the trussed rafter roof or some light frames) to make similar provision for partitions to be non-structural. Given a big enough market—and this surely exists—the cost of good-looking well-finished and reasonably sound-proof movable partitions should be little, if any, more than the cost of a 4½ in. brick wall plastered and painted both sides.

Heating and Ventilation

Post-war scientific advances in heating methods have enabled us to make one of the greatest changes in our approach to the design of dwellings. It is now possible—at economical running costs and with no dirt or hard labour—to transform those parts of the house hitherto cold and uninviting—into usable space for daytime or evening study and recreation.

It is impossible to generalise on the methods of heating which give the best value as conditions in each district vary, but it is certain that a much greater part of the dwelling must be heated if the best use is to be made of the space provided. Again flexibility is a most useful asset in a variable climate and allows for different patterns of family life. The ability for the tenant to control his heating system is an additional benefit, ensuring economical running and the suiting of conditions to his purse. Because of these factors the individual appliance would appear to have advantages over the communal heating system, though it is possible to incorporate a measure of both in some central systems. Undoubtedly there will be considerable advances made in the near future and the choice will perhaps become clearer when there is more comparative data.

Whatever the outcome in the 'battle of fuels,' the need for insulation will become greater as more of the dwelling is heated, and this is a clear case where a little extra capital expenditure can enable substantial savings in running costs to be made. Good insulation is therefore undoubtedly good value for money. Even the extra cost of double glazing, which years ago was thought to be unnecessary in our climate, is now worthy of careful consideration in order to ensure that the amount and cost of heat used to warm rooms with large areas of window does not become excessive.

One of our prevalent problems is condensation, and good insulation will go a long way towards preventing this nuisance. Ventilation is another aid and we should do well to adopt the continental practice of providing flues for permanent ventilation to the kitchen and possibly to the living room in cases where the number of air changes is likely to be below the standard required for healthy conditions.

As a result of departing from Dudley house area standards whilst endeavouring to retain the Dudley living areas (living plus dining, plus kitchen space) it is obviously in such matters as circulation and storage that we have suffered most. Halls without space for even a small pram and stores which are no more than passages have resulted.

There would appear to be a strong case for a more scientific approach to storage, particularly in distinguishing between the ground-floor store which provides for bicycles, garden tools and the larger children's toys, and the need for a quite different form of storage, probably upstairs in the case of a house, for trunks, cases, spare pieces of carpet and so on. Properly designed shelving in this sort of store can enable the space to be used vertically to the fullest advantage, the extra cost of the shelves being more than offset by the saving of floor space. Where a garage is provided within the curtilage of the dwelling it is obviously a sound economy to increase its size for storage purposes rather than to provide a separate ground-floor store. Looked at on the basis of this combined use, the extra cost of a garage built adjacent to a house may not be quite so big an extra as may be thought at first sight.

Building Organisation and Methods

I have been advocating bigger and better dwellings, more heating, better insulation, more positive ventilation and so on. My reason for this is the over-riding economic fact that we cannot afford to have housing which becomes prematurely obsolete. Nevertheless, if we are to pay for this more costly but more worthwhile investment without spectacular rises in rent (though the proportion of our income spent on housing is lower than it is in many other countries), the only possible solution would seem to lie in the direction of a much more intensive rationalisation of our building methods than has been achieved so far in housing.

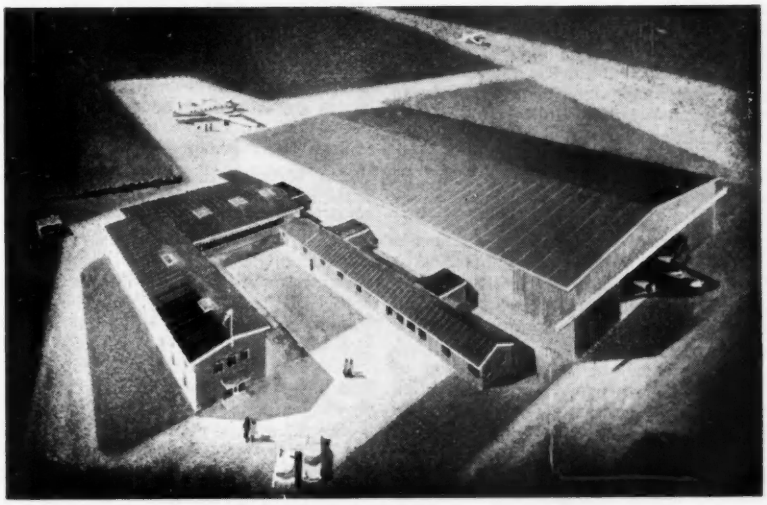
There has been much individual effort in this field but because of lack of co-ordination or inability to secure general agreement on such matters as standardisation the result has been extremely disappointing. Many attractive methods of construction have been invented, but because of inadequate production runs or lack of flexibility the great majority have failed to achieve their purpose. To secure much greater output, of good quality and at reduced costs, there will have to be much closer liaison between architect, engineer, manufacturer and contractor, and much greater combined determination (supported by central and local government) to succeed in breaking new ground.

A Workable Module

It will be necessary to agree a workable module, on acceptable tolerances and on constructional standards. The industry will then need to ensure that site organisation, cost control and programming are comparable with other industries. This can only be accomplished if there are long production runs carefully related to the labour force available, which in turn might require an alteration in the system of letting contracts. Technical resources could, to some extent, be pooled by regional consortiums of local authorities in a similar manner to the CLASP project in the educational field.

By rationalising our building methods in this comprehensive manner we should be able to achieve both greater output from the same number of technicians and workmen, and greater flexibility of dwelling grouping and interior arrangement. Such a system would have all the advantages of the 'package' contract without its serious disadvantages in loss of independent control in design and cost.

NEW BUILDINGS AT CARDIFF AIRPORT.—*A perspective of the new £50,000 engineering and administrative buildings for Cambrian Airways at Cardiff (Rhoose) Airport, on which work has just begun. The architect is Mr. W. Kenneth Graham, of Cardiff, and the main contractors are John Morgan (Builders) Ltd. The new buildings are expected to take six months to complete*



Building and the Economic Crisis

The Need to Stop Extravagant Building

BY J. PARRY LEWIS

The need to direct our building resources into channels most likely to assist the exporting manufactures was pressed by Mr. J. Parry Lewis, Lecturer in Economic Statistics in the University of Manchester, in a paper read to the British Association on September 1. A summary of his remarks follows.

CERTAIN ASPECTS of the present economic crisis are of particular interest to the building industry. Ever since the war we have been trying to do many things all at once. We have been trying to expand our exports in order to pay our way in the world, trying to improve our social services, trying to improve our standards of living, and trying to maintain our position as a major economic and military power. Each of these aims has called heavily on our resources of labour and capital and it is the inadequacy of these resources to perform all of these tasks that has been at the root of crises that have occurred every few years since the war.

A country can grow either by using more resources or by using its existing resources more efficiently. At irregular intervals over the past two hundred and fifty years, major crises have developed because of a failure to appreciate this fact, and each such crisis has been the end of a long period of prosperity in the building industry. Sometimes they have been brought on by war, but they have also occurred in peace time.

Taking a Long-term View

For many reasons an upswing in building tends to be longer than the upswing in other industries, partly because buildings take a long time to produce and are intended to last a long time. This encourages people to take a longer-term view and not to be unduly worried by minor recessions, provided that money and materials are available and costs are not too high. On the other hand, when the building industry has been doing well for several years there is a tendency for people to overdo things. Speculative builders jump on to the band wagon, already in full swing. The very scale of activity drives up the prices of materials and the wages of labour. Too many people try to borrow capital all at the same time, and this tends to push up interest charges. In short, building becomes more costly. It does so at a time when perhaps ten or more years of high building activity have already gone a long way towards meeting all reasonably essential needs. Suddenly, with essential needs largely satisfied and prices high, the demand for new buildings dries up. Speculative builders are left with empty property and no business, and the impact of their idleness is felt throughout the whole economy.

This is inevitably a simplification of the course of the collapse of a building cycle, but it represents fairly accurately the basic sequence of events that has occurred roughly once every generation for over two hundred years. In that our economy is now subject to more controls and to positive action to preserve a reasonable stability, it is unlikely that any future downturn in building will be as drastic as those of the past, but there is reason to believe that some kind of substantial downturn is on the way, especially in housing.

In 1951 there were more families than houses in almost every town and village in the country. In all, the number of families exceeded the number of dwellings by a million. Since then over two and a half million houses have been built, and by now the total number of houses and flats in the country is almost exactly equal to the number of families. The houses are not all in the right place, or of the right size, but the fact remains that although there are still substantial shortages in some areas, in other places there is very little shortage indeed.

I have looked at the figures for all the local authorities in England and Wales that had more than eight thousand dwellings in April of this year. If we exclude the London area, there are over four hundred such areas. In a seventh of these areas there were at least 1,036 houses or flats to every 1,000 families. In another seventh the number of houses to every thousand families was between 1,026 and 1,035. In another quarter of these areas the figure was between 1,016 and 1,025. In fact, in well over half of these areas lying outside the London area the number of houses to a thousand families was at least 1,016. Once a certain amount of empty property appears, new houses at high rents or mortgage repayments become less attractive as the price of empty property, no longer in a seller's market, tends to fall. In a very large part of the country we are reaching that position, although in the London area the situation is very different, and there remains a grave shortage of accommodation. Even there, however, high mortgage rates and high land charges are beginning to exert an influence on demand which should not be ignored.

Slums the Price of Economic Progress

But forces such as described take a little time to work themselves out, and when they do it is not always the right kind of building that ceases. There is, for example, a vast amount of slum clearance to be done, and an even greater amount of slum prevention. The decent housing of our people is a social obligation upon us all, and in that many of the industrial slums arise out of building to bad standards a hundred years ago in a feverish attempt to draw more and more workers from the fields into the factories, we have to realise that much of our economic progress in the past was in fact bought at the price of cheap housing then, and slums now. The clearance of these slums, wherever they may be, is a national responsibility, not a local one. If we are to prevent further slums from developing, then we must encourage the repair of property, especially of rented property, and this means giving the landlord a fair return. A further phased decontrol of rents, with adequate allowance for hardship, is the only sensible way of doing this. On the other hand there should be an obligation upon the landlord to provide accommodation and amenities of a reasonable standard in return for a reasonable rent. Neither the sitting tenant nor the landlord should benefit from controls and shortages that arose out of wartime emergencies.

The slum clearance programme and the better maintenance of existing property is urgent. There are about three-quarters of a million houses that have been declared unfit for human habitation, and there must be almost as many more that are almost in that category, or soon will be if they are allowed to go on being neglected. Every year that goes by adds to the number of near-slums. To deal with them will involve a large outlay, which our economy, from a short term angle, probably cannot afford. Yet from a long term angle we are only increasing the problem by deferring the obvious action.

Exports Our Present Greatest Need

Our present greatest need is to export, rather than to build houses. No sensible man goes in for a new house when his wife cannot pay the food bills, but that is what we are tending to do as a nation. I have just stated that a large amount of slum clearance and other building is urgent, but much of the building that is now going on, and is attracting both men and money from those fields of investment that could add to our productive power is neither urgent nor necessary. A new factory adds to our capacity to produce, and to pay our way in the world. A new bridge, or road, may speed the flow of goods. New schools are a long term investment of no less importance. These are building projects that should receive every encouragement. But competing with them we have the demands of sheer affluence. A great deal of new housing today contributes absolutely nothing to our earning capacity, but absorbs scarce resources that could be more fruitfully employed elsewhere. Large and ostentatious houses that are more status symbols than homes are dotted over the country like an unhealthy rash.

The desire to have a better house, or a bigger house, is not to be condemned; but we should realise that it is, from the point of view of the nation's economy, a complete waste of resources. There is more future for the economy as a whole and for the building industry if our building resources are diverted from this kind of activity into solid industrial investment. There is indeed a strong argument (which I propose to develop more fully elsewhere) for imposing a substantial tax on the difference between the cost of building a new house and some reasonable sum such as three or four

thousand pounds, simply to discourage the wasteful use of resources. Similar remarks can be made about much of our present office building, little of which would pass the acid test 'does it contribute more to our export drive than it takes from it in materials, capital and labour ?'

The present high interest rates and other costs, brought on very largely by the high level of building activity, are themselves tending to reduce the level of building, but they are to some extent hitting the wrong people, and are certainly discouraging important building schemes. Some kind of priority must be evolved, which encourages building that aids our economy, and discourages other kinds of building. A tax such as I have mentioned could be an important feature of such a scheme, but positive encouragement should also be given where it is due.

There is, of course, one thing that could solve the whole problem. We are short of labour and short of capital, and unless we are to go on from crisis to crisis, or to be strangled by a plethora of controls, we must sooner or later begin to use our labour and capital more efficiently. Economic progress consists largely of squeezing more and more out of less and less. The greatest single contribution towards progress would be a new attitude on the part of employers, employees and the government towards productivity. If, for just a few years, everybody (in every industry) would pull together in an honest attempt to create more, rather than to get more, we could pay our food bills and build our status symbols. Sooner or later we shall have to.

'Wage-Bribes by Large Builders'

Brighton Mayor's Call for 'Professional Morality'

WHEN the Mayor of Brighton, Councillor George Baldwin, opened the conference of the Midland Region Federation of Master Builders at the Grand Hotel, Brighton, on September 8, he complained of contractors who use big-wage bribes to lure away employees from small building firms. Councillor Baldwin, who is himself a builder, told the 200 delegates that in one week he lost five men to contractors who had come into the town.

'One contractor,' said the Mayor, 'advertised in the local Press and offered £20 a week for labourers carrying bricks. With that sort of thing happening you can't hold your craftsmen.' Some contractors, he said, completely disregarded local conditions by paying well over the rate and offering concessions which could not be operated by small firms. They granted lodging allowances to people actually living in Brighton.

The Mayor urged that a 'professional morality' should be built up to stamp out the problem which, he said, was one of the biggest headaches for the small builder.

The 'Little Squeeze'

FCEC Views

'THE RECENT GOVERNMENT MEASURES introduced to control the country's economy will have the effect of restricting temporarily further continued expansion in the work of the constructional industries.' MR. R. KEAN, CBE, Director of the Federation of Civil Engineering Contractors, made this statement on September 8 at a meeting of its South Wales and Monmouthshire section at Porthcawl.

He went on to say, however, that it had to be recognised that the constructional industries had been operating at very high levels, and there was still a large amount of work in progress which would continue to keep the industries busy for a considerable period; it would therefore be some time before the restrictive measures would have any appreciable effect on the overall load of work.

Maintenance of Road Programme

Mr. Kean said that although there would be postponement of some projected works in the public sector, he welcomed the fact that the Government had decided to maintain the road programme and to allow urgent and essential water and sewerage works to continue. He anticipated that the Government's measures might have some slowing-down effects in the fields of industrial construction, private enterprise, housing and commercial development. There was likely to be some easement in the overall labour situation and in the supply position of cement and bricks, all of which had presented a particularly difficult problem in the South Wales area in recent months.

While the Government's measures might well have been inevitable, said Mr. Kean, it was to be hoped that they would not be allowed to continue any longer than was absolutely necessary so as to allow the constructional industries to move towards further increased expansion.

Builders and Land

'THE BEST THING that private builders and estate developers can do in present circumstances is to give practical example to the "pause" warning uttered by the Chancellor of the Exchequer. They should exercise a "pause" of their own and show strict discrimination in any future purchases of building land.' This opinion was expressed by MR. R. W. RICKETTS, JP, National President of the Federation of Master Builders, speaking at the Annual Conference of the Federation Midland Region held in Brighton on September 9.

Dearer finance must put the buyer on guard, he added. Therefore, a determined effort by everybody concerned with the market in land could help to stabilise, and even to reduce, the basic cost of building. This would be greatly to the public advantage.

Facing up to Urgent Considerations

'During the immediate future—obviously a critical period in the country's economy—the building industry and those who work with it must face up to important and urgent considerations,' Mr. Ricketts stressed. 'One of the key factors to the whole situation is, of course, the availability and cost of building land. Houses and flats have been going up all over the country at a great pace; schools, hospital accommodation and office buildings, and in particular the latter, are gradually using up substantial areas of land. As a result, the price of land itself is soaring.'

'Direct Cause of Inflation'

A competent observer had recently stated that in the future no one earning less than £1,000 a year would be able to consider buying a new house, said Mr. Ricketts; here was a direct and immediate cause of inflation into which, apparently, the Government did not propose to enter.

Construction Orders

Value Drops in Second Quarter

ACCORDING to the latest figures collected by the Ministry of Works, the construction industries received new orders valued at £491m. in the second quarter of the year. This is lower than the value of orders placed in the first quarter of the year but even after allowing for an increase in prices, the reduction between the two quarters was less than normal, and the figure remained well above the level in the second quarter of last year.

Compared with a year earlier, total orders for new housing were at about the same level after allowing for changes in prices. New orders for work for public authorities were substantially higher and orders for private developers were at about the same level. Orders for industrial building were a little lower and those for the miscellaneous sector a little higher.

VALUE OF NEW ORDERS OBTAINED BY CONTRACTORS in £ millions

	Quarters of 1960		Quarters of 1961	
	1st	2nd	1st	2nd
NEW HOUSING				
For Public Authorities	61	62	73	64
For Private Developers	132	113	130	120
Housing total	193	175	203	184
OTHER NEW WORK				
For Public Authorities	131	121	157	142
For Private Developers				
Industrial	82	92	83	87
Miscellaneous ...	67	64	78	78
FOR PRIVATE DEVELOPERS				
Total	149	156	161	165
OTHER NEW WORK				
Total	280	277	318	307
TOTAL ALL NEW WORK	473	452	521	491

Note.—The figures given above will appear in the September issue of Economic Trends to be published by HM Stationery Office.

The Future of the Conurbations

Dr. Sargent Florence's Paper to the Planning Summer School

IN A PAPER read on September 7 to the Town & Country Planning School at Reading, DR. P. SARGANT FLORENCE, CBE, MA, PHD, spoke on the Future of Conurbations, in the course of which he sought to find out why conurbations had arisen and were arising in practically all developed, and even in some under-developed, countries. After dealing with this, he came to outlining a feasible policy, and said:

My main forecast of the future is that, in relation to the community as a whole, some English conurbations specialising in the growth industries, notably the West Midland, or providing central services that are wanted apparently more and more, notably London, will tend to increase in population and spread in area. Other conurbations may not increase their population relative to that of the whole country but will probably maintain it and, owing to slum-clearance and higher standard of living and 'small-family' privacy, will tend to spread through the countryside if uncontrolled, though to a less degree than the Midland and London Conurbations.

Thus growth or maintenance of population and above all a spread over the countryside—'sprawling' in the expressive planners' phrase—are the features of and form the problems common to the future of conurbations, if economic trends go unchecked.

I can now turn usefully to the customary overtone of the word 'future'—to utopia rather than subtopia. Knowing the causes of the tendency to grow and sprawl, can we not forestall what we have forecast, and check the growth and sprawl in favour of something else? But what else is feasible? Here I may and will exercise my Human Rights to set up a certain target of what I personally consider desirable and feasible. I will consider growth or maintenance of total population first, then its sprawl.

Cause and Affect

The growth and the persistence of large conurbations have been found to be mainly due to three sets of economic advantage: (1) the close proximity to a large market of consumers; (2) the large urban 'productive' unit at a favourable spot with low-cost utilities (such as telephone and power), a pool of labour, multiple localisation and linkages between industries (one supplying, advising or otherwise co-operating with the others); (3) the hierarchical centre providing specialist services. But there are economic disadvantages to put against these advantages, in particular (1) the distance of large conurbations from the bulk of their raw material requirements; (2) the congestion of goods and passenger vehicles on the roads within, and leading in and out of, the conurbations—traffic crawl can, in the indictment, be added to housing sprawl; (3) the delay, congestion and queueing of passengers using public transport, particularly at the inevitable rush hours; (4) the cost of the transport.

I need not repeat the *social* that can be added to the *economic* disadvantages of conurbations. Here Ruskin and Mumford and Sir Frederic Osborn can be left to cope with the contrary views of Samuel Johnson, though statistics no longer support the view that health and survival suffer in cities. Nor shall I deal with the concentrated target which conurbations offer to bombs and missiles. But there are some new statistical data officially presented that are worth introducing on the social class segregation of English conurbations. Out of the five social classes recognised by the Census remarkably few residents of Class I were discovered in the central cities of each of the five provincial conurbations, or of Class II either. In London the first and second social classes formed 209 per thousand of the population; in the five provincial conurbations only 164, 161, 142 and 137 per thousand. This is sad enough, but in the central area of the provincial conurbations the first two classes were further separated out. In London the central area housed 263 of them per thousand population, but in the provincial conurbations only 110, 108, 92, 84 and 67!

What Shall Policy Be?

Balancing disadvantages economic and social against advantages, what shall policy be on total population of urban or conurban development? I am not a believer in any optimum size of cities and I do not think that all conurbations should be brought down to a fixed size below say 800,000. My hierarchy has some logic, even some good sense in it, as far as those cities are concerned which offer rare, and a wide variety of, services that otherwise might not be in sufficient demand. London, Paris, New York, Chicago, Boston, San Francisco are each a true metropolis—a mother city providing very special services for its large region and requiring a large population to function effectively.

But what of Pittsburgh, Detroit or the West Midland conurbation? Frankly, they might well be reduced below the million population mark probably without industrial, and certainly without cultural efficiency, suffering. We must, however, be practical and realise that the investment in houses and institutions, roads and sewers, even 'man-sewers'—in short, the 'social capital' that is still effective for its purpose—cannot just be scrapped. The population of the conurbation relatively to that of the whole country can only be reduced gradually. In *Conurbation*, published in 1946, we suggested that the West Midland Conurbation should not be allowed to grow faster than its natural increase in population. But we underestimated our local natural fertility! Even keeping to the original boundaries, natural increase of population has in fact turned out so large (76,783 in the seven years 1951-57, or about ½ per cent a year) that stricter limits should be aimed at. An ideal target, though perhaps not practical, is absolutely no increase in population within the conurbation including the green belt and its white infillable islands.

When we turn from the total population of a conurbation to consider the shape of its distribution and in particular its sprawl, 'target' is a particularly apt word. What I suggest we aim at is a series of more or less concentric rings. In the centre, the bull's eye or gold, need not with redevelopment remain so empty of residents, particularly in the provincial conurbations of higher class residents, as the volcano's core, nor the next ring so densely built up as the crater's lip.

The third ring, the suburban, is now having housing estates built at higher densities. In short the three inmost rings can have, and in fact are having, their contrasting densities smoothed out.

The green belt, the fourth ring, except for the infilling within its 'islands', must not by definition increase in population. The regional area (or fifth ring) beyond the green belt may be severely restricted where conurbations such as Merseyside, SE Lancashire and West Yorkshire almost impinge. Presumably their respective green belts will often coalesce. But two of the 'Conurbation Regions' beyond the green belt that are free and that need most control have this very year been subject to detailed plans of dispersion. Both for the London and the West Midland Conurbation regions these plans envisage New Towns in spite of Ministerial hesitations, and large extensions of the smaller old towns, unless such extensions impinge on very fertile land or fine scenery.

These Conurbation Regions are still on the target. They are not in outer space, but have, or should be planned to have, industries linked to those in the conurbation. The employers who, planners hope, will be induced to build factories beyond the conurbation will certainly have regard to their former connections, and must usually build at least in the region of the conurbation that was their metropolis or mother city.

Books Received

**** *Books noted in these columns may be obtained on application to the Book Dept., 'The Builder,' 4 Catherine-street, Aldwych, WC2. Cash (to include 9d. postage on books to the value of* 10s.; 1s. 6d. *over* 10s.) *should accompany the order.*

FUMIFUGIUM: OR THE SMOAKE OF LONDON DISSIPATED, by John Evelyn. (London: National Society for Clean Air.) Price 2s. 6d.

BUILDING CONTRACT VARIATIONS AND FINAL ACCOUNTS. By G. Chrystal-Smith. (London: George Newnes Ltd.) Price 35s.

STEEL FRAME DESIGN EXAMPLES. By Ian Robb. (London: Cleaver-Hume Press Ltd.) Price 30s.

NEW COMMUNITIES IN BRITAIN. By J. H. Nicholson. (London: The National Council of Social Service.) Price 10s. 6d.

Cremation as a Form of Land Economy

Manchester's Problem

CAN A CITY with 60,000 slum houses and an acute shortage of building land afford to have hundreds of acres within its boundaries taken up by cemeteries, allotments and a 120-acre municipal golf course?

The question was posed at the annual conference of the Institute of Parks Administration in Manchester on September 7 by MR. H. R. PAGE, Manchester City Treasurer. He presented figures showing that Manchester had 740 acres—enough for 14,000 houses building at a density of 20 houses an acre—absorbed by cemeteries, allotments and smallholdings, and the golf course.

'It really is fantastic to think of the acres of land being utilised in this city for cemeteries when we have 60,000 slum houses and are being forced to overspill 100,000 of our population because of our lack of living space,' he declared, adding that he foresaw extremely heavy rate burdens in the future for the maintenance of cemeteries. One could not dissociate oneself from the religious and personal aspect of cremation, but, he added, 'in my opinion it would be almost worth while offering free cremation in order to encourage it. The cost involved would be offset ultimately by the savings in land and maintenance costs.

'If a city like Manchester can afford to use nearly 250 acres for allotments and smallholdings should not we charge a fair price for them to give the holders a real incentive to use them properly? Does 120 acres for a municipal golf course represent a proper use of land? A municipal golf course is a very good thing, but in circumstances of shortage of land and with 60,000 slum houses is it a sufficiently good thing to justify its retention?'

Development on 'Ring' Basis

The centre, or bull's eye, he suggested, need not with redevelopment remain so empty of residents, particularly in the provincial conurbations of higher class residents, where the census had revealed that remarkably few people belonging to either class 1 or 11 (higher and lower groups of professions, employers, managers and executives) lived. The next ring need not be so highly built up. The third, or suburban ring, was now having housing estates built at higher densities, therefore the three inside rings were already having their contrasting densities smoothed out.

Forming the fourth ring was the green belt. Except for the infilling within its 'islands' this must not by definition increase in population. The regional area, or fifth ring, beyond this belt might be severely restricted where conurbations such as Merseyside, south-east Lancashire and west Yorkshire almost impinged. Presumably their respective green belts would often coalesce.

'But two of the conurbation regions beyond the green belt that are free and that need most control have this very year been subject to detailed plans of dispersion. Both for the London and the West Midland conurbation regions these plans envisage new towns in spite of Ministerial hesitations, and large extensions of the smaller old towns, unless such extensions impinge on very fertile land or fine scenery.'

Industries should be planned in these conurbation regions and be linked to industries in the conurbations. But only some industries were 'foot-loose' and could be placed at will, be run in small or medium-sized plants, and were adaptable to other circumstances.

Attempts at weight-reduction, however, were rare. 'Too many, alas, in local authority have megalomania and consciously or subconsciously are trying to increase their conurbations' quantitative record.'

A Building Preservation Order

Architectural Interest not Divorced from Surroundings

FROM A LEGAL CORRESPONDENT

A CASE of considerable interest to builders and architects was recently decided as *Iveagh (Earl of) and Others v. Minister of Housing and Local Government and Another* when the Minister had to decide whether to confirm a building preservation order on 2 properties at 11 and 12 St. James's-square. The case had the interesting feature that the Minister confirmed the order despite the fact that his inspector did not consider that the property warranted its preservation.

The London County Council had submitted an order for confirmation on the following grounds: 'No. 11 St. James's-square, built in 1735-36 and later refaced, shares a uniform frontage with Nos. 9 and 10 (for which a building preservation order has been made), and the front although now altered is essentially that designed circa 1775 by the brothers Adam. No. 12 St. James's-square is said to have been built by Thomas Cubitt in 1836-7. Both houses retain internally some of their original features and their demolition or alteration would be most detrimental to the preservation of the character of St. James's-square.' The applicants wished to demolish the properties and rebuild with modern up to date and convenient office buildings and were advised that this could be suitably done by a distinguished architect.

The Minister reached the following conclusions: 'The buildings are situated in the least spoilt corner of one of the most famous of the historic squares in central London and form part of a continuous frontage presenting the general appearance of the square as it existed in the late eighteenth and early nineteenth centuries. The Minister considers that the character of this part of the square should be preserved if at all possible and that it would be seriously impaired by the destruction of Nos. 11 and 12. He is satisfied that in their context these buildings possess a considerable degree of architectural and historic interest and he has accordingly decided to confirm the building preservation order.'

The case raises one or two important issues. In dealing with two buildings the court considered that the architectural interest of buildings could not be divorced from their surroundings and therefore the Minister had been right in considering the buildings not in isclation but as part of an architectural block. But on the other hand the Minister's decision could not have been properly based on the effect on the square of the destruction of the two houses because that was an issue relating to the square and not the two houses in question. The Minister could have regard to special historic interest but this was in the alternative to special architectural interest and if one or other was good it would justify the conclusion reached by the Minister that 'in their context the buildings possess a considerable degree of special architectural and historic interest.'

Certain general points arise from the case. The onus is on the applicant to show in such a case that the Minister has exceeded his powers: the court is no judge of whether the facts have been correctly judged by the Minister. The duty of the court was to construe the wording of the section strictly or benevolently having regard to the fact that compensation was payable but to give it a natural meaning. They were not to be influenced by outside considerations, such as the fact that the local authority had once been prepared to give planning consent for the demolition of the building but had changed its view, that no preservation order had been made in respect of an adjoining property, and that the properties in question were treated as supplementary list buildings.

Windsor Castle Ceiling Restored

THE PAINTED CEILING of the Queen's Audience Chamber at Windsor Castle has been restored by the Ministry of Works after a large area of it was seriously damaged by water seeping from a burst pipe. One of the Ministry's expert restorers, Mr. J. E. Meade, spent a year on the work, which included a substantial amount of reconstruction of the damaged portion. The room, one of the State Apartments at Windsor Castle, has now been cleared of scaffolding, and the painting is once more on view to the public. The ceiling measures 45 ft. by 31 ft. and was painted by Antonio Verrio in 1678. It depicts the Queen of Charles II, Catherine of Braganza, being towed in a chariot by swans to the Temple of Virtue, and attended by goddesses and other allegorical figures.

British Standards

Water Absorption; 'Guaranteed Minimum' Reckoners; Safety Valves and Gauges; Cable Covers, Concrete and Earthenware

Water Absorption and Crazing of Vitreous China (BS 3402 : 1961)

THIS STANDARD gives details of tests for the degree of water absorption and to show up any tendency to crazing of vitreous china sanitary appliances. In addition, some limits to the test results are given which help to define vitreous china in the range of clays used for the manufacture of sanitary appliances. The standard (price 4s.) is not intended to be used for the final selection of individual articles.

'Guaranteed Minimum' Reckoners for the Building and Civil Engineering Contracting Industries (BS 1151 : Part 2 : 1961)

THE ADOPTION by the building industry of the 42-hour week—to take effect from October 2—has necessitated the revision of this standard (price 6s.). These reckoners facilitate the calculation of the formula $GM = WHA \times \frac{36}{NH}$ where GM = number of hours 'guaranteed,' WHA = working hours available and NH = normal hours laid down in the working rule agreements.

Safety Valves, Gauges, and other Safety Fittings for Air Receivers and Compressed Air Installations (BS 1123 : 1961)

THIS STANDARD (price 4s.) is a revised and enlarged BS 1123, first published in 1943. It gives specifications for safety valves, gauges and other safety fittings for air receivers and compressed air installations. Although the main provisions of the standard remain unchanged, modifications have been made to secure co-ordination with the 1955 edition of revised BS 759—'Valves, Gauges and other Safety Fittings for Application to Land Boilers and Piping Installations for and in connection with Land Boilers.' The most important of these modifications is the permissible use of safety valves having an established discharge greater than provided for by the minimum aggregate area formula. The revision also includes a comprehensive specification covering the requirements for safety valve springs.

Cable Covers, Concrete and Earthenware (BS 2484 : 1961)

ADVANCES in the technique of cable laying whereby several single-bore cables are laid side by side in preference to the use of a multicore cable, have necessitated the use of wider cable covers, as it is not entirely satisfactory to lay narrow ones side by side.

To meet the needs of these new methods, BS 2484 (price 6s.) has been revised to include wider covers in the range. In addition a shorter length of cover has been introduced to provide for the modern practice of negotiating curves and bends by short length straight covers in preference to using radius covers as this simplifies both ordering and stock keeping.

Account has also been taken of the results of a research programme carried out by the Central Electricity Generating Board into the incorporation of raw pulverised fuel ash in concrete mixes by allowing for a proportion of this 'flyash' to be used in concrete covers with the consent of the purchaser. At present there is no British Standard for this material, but its preparation has been authorised.

Copies of these Standards are obtainable from 2 Park-street, W1.

The Dangers of 'Do-it-Yourself' Building

Deaths Caused Through Lack of Skill

THE assistant coroner, Mr. H. T. Manknell, told a jury at Bradford on September 6 that two 'do-it-yourself' builders had lost their lives because they did not know enough about the dangers involved. If they had known more, taken more precautions, or gone to the expense of having the building erected for them, he continued, the accident which caused their deaths would probably not have happened. The jury returned a verdict of accidental death on Thomas Hewitson, an engineer, and Archie Barrett, a registrar, both aged 60. They died from multiple injuries when a concrete building they were erecting collapsed on them. The building was to be used to expand the welding and engineering business of Mr. Hewitson.

In evidence, Mr. Hewitson's son, who escaped with minor injuries, said that he and his father bought precast concrete components and were supplied with plans showing the general arrangement. The supplying firm had given an estimate for carrying out the work, but this had been turned down in favour of 'do-it-yourself.'

Mr. Hewitson said they had taken away the props supporting the uprights the day before the collapse. He afterwards realised that this was too soon, especially since the wind was rather strong at the time. Mr. Ian Hamilton Paxton, a consulting engineer, told the court that the uprights should have been securely propped until they had been set in concrete. Unless this was done, he continued, it would require only slight movement from the vertical to cause the whole framework to collapse. A strong wind would have been sufficient.—*The Times.*

Underground Power Lines

Move to Improve Local Amenity

SCHEMES to place small sections of power lines underground were announced by Mr. Nevill Marsh, chairman of the East Midlands Electricity Board, at the meeting of the general purposes committee of the East Midlands Electricity Consultative Council on September 6. He said that in order to improve local amenities, especially in picturesque villages or in localities of outstanding beauty, the Board were prepared to carry out schemes of placing the lines underground.

The first plan under this project is the placing of the lines underground in certain villages in Northamptonshire. But it is possible that two or three such schemes will be undertaken each year in different districts.

Work to Progress Gradually

Mr. Marsh said the Board would be pleased to consider suggestions from other local authorities to carry out such 'tidying-up' work. He added that the 'undergrounding' of lines would not happen overnight; but the Board would try to ensure that it did take place gradually, at least with the lower voltage lines, always bearing in mind that the cost was four or five times that of putting the wires overhead.

The Institute of Housing

Conference at Eastbourne

THE THIRTIETH ANNUAL CONFERENCE of The Institute of Housing is to be held at the Winter Garden, Eastbourne, on September 21 and 22. The president of the Institute, Mr. R. J. Allerton, FRICS, director of housing, London County Council, will be in the chair. The proceedings will open with an address by Dame Evelyn Sharp, GBE, Permanent Secretary, Ministry of Housing and Local Government, followed by the presidential address.

A memorandum of evidence on 'Housing Standards' will be presented for discussion at the afternoon session on the first day, the opening speakers being Mr. J. P. Macey, FRICS, housing manager of Birmingham, and Alderman A. R. Nobes, OBE, JP, of Gosport. 'Housing Policy Since the War—What of the Future?' is the subject of a paper to be given by Mr. D. V. Donnison, BA, reader in social administration at the London School of Economics and Political Science, on September 22. The subject for discussion at the afternoon session will be 'Housing the Aged and Infirm,' on which the speaker will be Dr. R. C. Wofinden, MD, professor of public health, University of Bristol. Some 400 delegates will visit housing estates at Eastbourne and Battle rural districts on September 23.

The Quantity Surveyor's Office Today

Modernisations of Techniques

The following paper by Mr. B. D. Henderson, FRICS, was submitted to the annual conference of the Royal Institution of Chartered Surveyors at Leicester University on July 5. It follows on a meeting on techniques in quantity surveyors' offices held at the Institution in April, 1960. It does not, however, exceed the scope of that meeting and therefore the use of electronic computers and punch card systems are only indirectly touched upon. Also, as the title suggests, only methods of production of bills of quantities and final accounts have been considered. Forms of presentation are mentioned only in so far as they affect production methods.

APART FROM the normal or 'London' method of taking off and traditional working up involving abstracting and billing, the current tendency seems to be for experiment in the use of systems whereby traditional working up is reduced or eliminated. This, in many cases, does not appear to be the result of a logical appraisal of quantity surveying methods, but rather a matter of expediency, due to a shortage of workers up. That the introduction of new and more efficient methods of carrying out our work has been brought about by expediency rather than by our own forethought and volition is a matter of some disquiet and, I think, should serve to remind us of the need for more frequent and objective examinations of our methods.

The techniques now described fall mainly into two categories, i.e., those which partly eliminate and those which completely eliminate traditional working up (abstracting and billing).

A—Systems Partly Eliminating Traditional Working Up

(I) ELIMINATION OF ABSTRACTING BY BILLING DIRECT.—This is, of course, a technique which has long been used for certain sections of taking off such as drains, joinery fittings, etc., the dimensions for which, owing to the fact that the great majority of the items form the whole or part of a trade, can, by inspection, readily be collected and billed without abstracting. This traditional use has been extended to cover complete jobs and is most suitable for small or medium sized jobs of reasonably simple design or of a fairly familiar pattern.

Billing direct systems require close co-operation between takers off and between takers off and biller. It is very much a 'team' project. This is necessary in order to avoid duplication of adjustments among takers off and to ensure that the biller has a knowledge of what items to expect and where he is likely to find them. It is advisable that the number of takers off be kept to a minimum and, in practice, it is found that two is ideal for the main work, with additional help as necessary for isolated sections such as foundations, drains and internal plumbing.

The taking off is done in such a manner as to measure as many items as possible of any one trade in one section of taking off and also as to reduce the amount of collecting of similar items. The extent to which this is possible depends upon the type and size of job, the experience and number of takers off. Basic principles are that sections are taken off generally on the 'London' method with adjustments for windows, doors, etc., at the end of each main section, e.g., in the case of 'finishings' deductions are measured followed by finishing to reveals, etc. This ensures that the bulk of 'finishings' items are grouped together in one section of dimensions. Important requirements are: detailed schedules of doors, windows and finishings for each taker off, detailed taking off list noting departures from normal, correct grouping of takers off, e.g., brickwork and internal finishings to be done by the same taker off, space left for collections and full referenced dimensions.

Billing can be done by a good worker up after a briefing by the taker off or it can be done by the takers off themselves. Possibly the most economical way is for the taker off to dictate the bill on to tape not worrying, at this stage, about nicety of description and order, etc. This can more easily be corrected on the typed draft bill. For reference purposes it is important to insert the page number of the dimension sheet against each item of the draft bill, preferably in the shillings column.

(II) ELIMINATION OF THE PREPARATION AND CHECKING OF ABSTRACTS BY TAKING OFF DIRECT ON TO ABSTRACT.—This method requires to be operated by experienced and competent takers off and a disadvantage is that the dimensions are not able to be altered readily during the taking off in the event of a revision to the drawings. Single foolscap size dimension/abstract sheets are used and it has been found in practice that it is advisable to have very few items on a sheet, in many cases only one or two. Thus, in effect, this system would appear to be virtually one item away from being a loose-leaf system.

(III) ELIMINATION OF BILLING BY USING FULL DESCRIPTIONS ON ABSTRACT AND EDITING ABSTRACT AS A DRAFT BILL.—An advantage of this method, compared with those mentioned in (i) and (ii) above, is that no special techniques or restrictions are imposed upon takers off. A development of this system is the pre-printing of 'pro-forma' abstract sheets. This improvement was tried initially on the easy trades (glazier, painter, drainlayer, etc.) and was later extended to concretor, bricklayer, etc. The pro-forma sheets are single foolscap, to facilitate handling by typists, and where possible they have adaptable headings so that they can be used for a selection of similar items, e.g., '26 oz/32 oz. clear sheet glass and glazing to wood/metal with putty/beads as described (beads provided).' In practice these sheets have been used successfully for all types of work.

(IV) ELIMINATION OF BILLING BY A CARD SYSTEM OF ABSTRACTING.—In this system taking off is done in the normal way. When the dimensions are handed out for working up each item is abstracted on to a separate card and if necessary the cards can be coloured so that each trade has a separate colour. After having been cast and reduced, the cards, which are in bill order, are edited, re-numbered if necessary and sent direct to the printers.

B—Systems Completely Eliminating Traditional Working Up

(I) 'LOOSE-LEAF' SYSTEMS.—Several systems are in use, varying quite considerably in detailed operation, yet all founded on the basic idea of one item—one sheet. The basic principles are as follows:

Taking off is on the 'London' method and each item is taken off on a separate dimension sheet. Where continuation sheets are necessary or where a taker off measures, adds or deducts an item fully described by another taker off, abbreviated description, or page references if available, are used. Therefore, one item may comprise a number of sheets of dimensions. One of these, the 'parent' sheet, contains the full or 'parent' description. To save re-writing blocks of dimensions for an item which on normal dimension paper would be 'anded on' to another item (e.g., 2 coats emulsion pt 'anded on' to R & S walls) the description is written on a new sheet and cross referenced so that the quantity can be filled in when squared. When taking off is completed, dimension sheets are sorted into trades and then into bill order. The order is checked, descriptions altered as necessary (for 'dittos,' etc.), preamble sheets, heading sheets, end clause sheets, etc., are inserted and with squaring, casting, collecting and reducing completed a draft bill results which is ready for final editing. Bill stencils can then be cut or the shuffled sheets sent to the printers. Some surveyors prefer to type the draft bill from un-edited dimension sheets and then edit the typed bill.

The other system I have included is called the 'cut and shuffle' system. This system is a development of the so-called 'shuffle' system (a variant of the basic 'loose-leaf' principle) which my firm previously introduced into a branch office. Very briefly, the main departure from the basic idea is that the dimension sheets, of special paper to facilitate economic reproduction, are of approximately foolscap size used lengthways. There are four similar rulings on each sheet so that each sheet contains four smaller dimension sheets or slips. When taking off is completed a copy of each large sheet is taken.

The copies are then cut into the four slips which are shuffled into bill order. Thus the slips form an abstract draft bill, whilst the original large dimension sheets remain in taking off order.

We devised the 'cut and shuffle' system specifically to overcome four main disadvantages found with the 'shuffle' system. The first two disadvantages are due to the very large number of dimension sheets produced. The second two are the consequences of the physical impossibility of the sheets being in two different orders at any one time. These disadvantages are:

1. Takers off find it a source of annoyance and a time consuming occupation to refer back, when taking off, to items previously measured. The ability to see several items at a glance, as with a page of normal dimension paper, is lost.
2. The awkwardness of using large stacks of dimension sheets for variations, etc.
3. When the dimension sheets have been sorted into bill order contact has been temporarily lost with the taking off order. Therefore, at the important final stages of bill drafting and editing, it is impossible to refer to the dimensions as such.
4. At the variations stage, when the sheets are back in taking off order, difficulty is experienced in locating particular items or dimensions unless a very comprehensive referencing system is adopted.

Of the above, the third is probably the most serious, as it occurs when there is normally least time to spare. The 'cut and shuffle' system, it is believed, overcomes these troubles, respectively, as follows:

1. With four items per page, and two finished sheets in front of him, the taker off can see at a glance at least eight previous items.
2. The original large taking off sheets are retained uncut.
3. The original sheets are available, in taking off order and, of course, with the original descriptions, to refer to as necessary by the chief worker up (drafter), taker off or partner during the final stages.
4. The cut slips are in bill order, in trade batches if required, and therefore act as a perfect abstract for referencing purposes. At the same time the original dimensions are also to hand.

A final point in connection with the 'loose-leaf' type of system. As mentioned before, some surveyors seem to prefer to write or type a draft bill from the shuffled dimension sheets. It seems to me, however, that the most efficient use of the system demands the elimination of this step, and, to bring it to a logical conclusion, the printing of the bill from the edited sheets. However, it is, of course, desirable to have direct stencilling wherever possible in any system.

(II) THE 'TRADE BY TRADE' SYSTEM.—The main principle of the 'trade by trade' system is that taking off is carried out in order of billing. The trade is equivalent to the section of taking off in the 'London' system. Each item is therefore taken off as a separate entity in the order in which it will eventually be billed including all relevant deductions.

The number of trades undertaken by each taker off varies according to the size of the job, the number of staff available and the speed with which the bills of quantities are required. It is claimed by those practising this system that there are no difficulties or disadvantages in having each trade dealt with by a different taker off. The first essential in its working is that each taker off should be armed with schedules of door openings, window openings and room finishings which must be agreed with the architect before the taking off is commenced. It is important for this information to be available at all times to each taker off as it is necessary for the taker off of one trade to be aware of the requirements of the other trades and to ensure, for example, that the deductions for openings in the plasterer are based on the same size brick openings as the deductions for openings in the bricklayer.

The taking off is commenced and each item is completed before proceeding to the next in order of billing. It must be borne in mind that the taker off is concentrating solely on this one trade and is not concerned, whilst taking off this trade, with any others.

Some firms use a modification of this system for small jobs. The taking off is done by trades on bill paper in approximate bill order, the resultant document thus being both the dimensions and the draft bill as with the normal 'trade by trade' system. When edited, items out of order are referenced to the correct order or numbered for typing or direct stencilling.

Comment

It would seem that, leaving computers and punch card systems aside, the 'loose-leaf' or 'shuffle' type of system, in its ultimate form, provides the best solution for the production of bills of quantities when the 'London' method of taking off is being used. This conclusion is arrived at because there are no intermediate stages, except one manual sorting of dimension sheets, between the taker off's descriptions and dimensions and the printed bill. It seems clear that all systems which entail the writing of descriptions or dimensions more than once are more liable to human error and also, almost certainly, are less efficient. Such an observation brings me naturally to the 'trade by trade' system which, and I do not think there can be any disagreement here, is the most direct method of all.

The 'trade by trade' system would seem to have virtually all the merits of 'loose-leaf' systems with the additional advantage that the overall time for production of bills of quantities is slightly reduced, as each trade can be printed as soon as it is taken off and edited. This, of course, adds flexibility to printing arrangements. Further, no sorting, cutting or elaborate referencing is required; the dimension sheets, together with the schedules, being complete in themselves and forming the only document necessary. Nevertheless, it does seem that a greater burden is placed upon the taker off under this system in that his train of thought could be deflected by considerations of bill order, and this may well considerably more than offset the advantage of no sorting, etc. Also, three particular doubts appear to exist in the minds of those who have not used the 'trade by trade' system. These are: (1) that the method of taking off by trades as opposed to related sections of work would lead to errors or omissions which would be difficult to detect; (2) that on large contracts involving a number of takers off, most of whom would require a full set of drawings and need to acquire an intimate knowledge of the whole job, the amount of duplication of effort would be uneconomic; and (3) that late alterations in design would involve considerably more work (in adjusting dimensions, printed bill, etc.) than in the 'London' method.

In answer to these points, those surveyors who have used the 'trade by trade' system for many years confidently maintain that the first doubt is quite unfounded as, once the method of taking off is properly understood, there is no more danger of error than in any other system. It is agreed by some that the second point might seem, on the face of it, to be a valid criticism. In practice, however, all takers off co-operate very closely and prepare notes for each other about matters which, they know from experience, will save research by one taker off in quest of information already obtained by another. It is the opinion, therefore, that although a certain amount of extra time may be involved, it is minimal and of absolutely no consequence when compared with the advantages the system has to offer. As regards the third doubt it is generally admitted that, should late amendments occur, more work would be needed to effect the necessary revisions than in the 'London' system. The point is made, however, that success in working the 'trade by trade' system depends to a large degree on certain basic information being provided or agreed with the architect before taking off commences. Also the architect must agree to a time limit for incorporating amendments. It occurs to me that all that this really proves is that the 'trade by trade' system exponents are also very persuasive characters. However, if, merely by adopting their system, all quantity surveyors could equally efficiently condition their architects, it might be a good thing for the whole building industry if we changed to it immediately!

There is one more point I should like to make which is particularly relevant with regard to the foregoing remarks and which I think should be considered by any surveyor deciding to adopt one or other of the two systems just compared. It is that 'loose-leaf' systems are based on a well-tried method of taking off following logical sequences of measurement based on the functional requirements of a building. This, I believe, cannot be said for the 'trade by trade' system. I submit that the 'trade by trade' system,

although an excellent method of producing bills of quantities, is not a 'system' of taking off as such since the order of taking off is not dependent on any systematic method but merely on an order of billing based (south of the border at any rate) on the somewhat mis-named standard method of measurement and current billing practice. Therefore, it would seem arguable that the chances of errors or omission occurring, inherent in an 'artificial' method, are greater than in a method which was designed for its purpose and which will remain unaffected by the deliberations of the Standard Method of Measurement Joint Committee or changing bill layouts.

Production of Final Accounts

Under the RIBA Form of Contract, the quantity surveyor is required to measure 'bona fide' variations, the contractor being present if so wishing, and to value what he has measured. It is also mandatory for him to supply the contractor with a copy of the '. . . priced bills of variations.' This is seldom enforced but the implication is, of course, that a bill of variations must be in existence. In effect, the quantity surveyor must account to the client for any change in the contract sum brought about by variations. A quantitative and financial 'account of variations' will do this.

In view of the fact that a standard form of contract can never be entirely up to date in interpreting the intentions of the parties to it, particularly in regard to matters of current practice and the more so when certain traditional concepts are being cast aside, I am going to assume that the term 'bills of variations' can be taken to mean an 'account of variations.' A bill of quantities has, for obvious reasons, to be presented in a specified form. No such rigidity is necessary for an 'account of variations' and the order in which items are booked is unimportant. It is a means to an end and the best 'means' is, therefore, the one most suitable for the quantity surveyor. The work entailed in producing any variation account is measurement, pricing, agreeing, extending and totalling. The ideal would be for all this to be dealt with in one document at virtually the same time. This, in fact, can be done and is being done as hereunder described.

The basic method is currently used both in private practice and by Government departments. The main requirement is the use of paper on which dimensions, descriptions, rates and extensions can be written. The type of ruling best suited for this purpose is similar to that which is often termed 'estimating paper' ruling. A dimension book ruled in the same manner has been found to be very useful when measuring on site. The pages in the book are perforated and on return to the office can be extracted for inclusion with the rest of the account. Daywork sheets with cash columns which, when checked, can become part of the final account without abstracting or billing are also suited to this method.

By using the above mentioned paper, etc., a single document can be produced which will contain all the information required in an 'account of variations.' No abstracting or billing need be done as, in general, it is more economical to calculate a few more extensions, etc., than for a worker up to carry out collecting or abstracting of items. Thus the items are priced, extended and cast in the order in which they were measured. A summary of the variations in the form of a statement of final account would normally be prepared.

To gain the maximum benefit from this method it is desirable to measure and agree rates with the contractor at the earliest opportunity and, if possible, agreement should be reached as and when each variation is measured. If this is done on the site the surveyor can have the account extended and cast on his return to the office. Similarly, with variations measured in the office, the account (or a copy if preferred) should be sent immediately to the contractor for agreement. By this means the financial position of the job can more readily be kept up to date.

Although delay is not always our fault, it is a duty we owe to our clients to do all that we can to speed the settlement of final accounts. The adoption of the type of technique described above would, I suggest, go a long way towards achieving this. It has been found that contractors, whilst occasionally a little wary of such early agreement, generally co-operate with enthusiasm and are appreciative of the greater efficiency of the method.

Another method of producing final accounts is that of booking measurements direct on to abstract. This method is similar to that previously mentioned under (A (ii)). It is more suitable for measuring variations than for producing bills of quantities since, if the contractor books with the surveyor in the conventional manner, elaborate indexing of dimensions is unnecessary.

Other Techniques

(I) DECIMALS.—Quite apart from the introduction of a decimal or the metric system as a whole, I believe that the use of decimals in our work could be extended immediately without drawback to others and with advantage to ourselves. Now that calculating machines, the majority of which work on decimal principles, are in general use, it seems a pity that their capabilities cannot be fully utilized. A simple start could be made by asking contractors to price bills of quantities in shillings and decimals of a shilling, preferably to only one place of decimals. This, in fact, has been done by at least one firm of surveyors and the benefits were noticeable. Such a step could well be followed by writing dimensions in feet and one place of decimals. It is, however, not advisable to load takers off with problems other than those of measurement and description, so if drawings are in feet and inches, the calculator operator must make the conversion as he normally does, but, I suggest, to only one place of decimals. If, combined with the foregoing suggestions, a standard denomination for all quantities were accepted, such as feet (and lbs.), then life would be much simpler. However, the real solution is to switch to the metric system complete.

(II) STANDARD PREAMBLES AND DESCRIPTIONS, ETC.—Many surveyors use some form of standard preambles and/or bill descriptions. However, to be of proper value, constant revision is necessary to standard preambles to keep them up to date. The advantages to be gained from their use are that, if every taker off has a copy he knows exactly which items he has to describe fully and which will be described in the preambles. Furthermore, if there is a 'pricing instructions' subheading in the preambles to each trade (where necessary) the taker off will know the exact form certain descriptions take.

Standard bill layouts and descriptions can be decided, trade by trade, either at the same time, or after the particular standard preamble is being dealt with. It may also be an advantage to give consideration to a standard order of saying things within the description itself. That time spent on these problems of standardisation may well reap rewards that are not immediately obvious was indicated in the interim report of the Working Party on 'The Use of Computers for Working Up.' this report stated, 'inter alia,' quite bluntly that, 'standardised descriptions are ultimately inevitable.' It further went on to state that 'standardisation of descriptions, at least within the individual office or department, is necessary if computers are to be used for working up.' It does, therefore, seem advisable that quantity surveyors should direct some of their energy toward producing acceptable forms.

(III) PRINTING CALCULATORS.—As several firms are now using printing calculators a few remarks may not be out of place. First of all, to be of any real use to quantity surveyors, the calculator must have two registers in order that accumulating may be carried out. The basic points in favour of printing calculators are as follows: (1) Simplicity of operation. (2) Legibility. (3) All operations can be carried out without re-inserting previous totals; therefore, all errors due to transferring are eliminated. (4) Collection sheets and money columns can often be dispensed with. (5) Squaring dimension columns may be omitted. (6) Checking by another operator, repeating the same calculations, is unnecessary. As the machine also shows, by way of symbols, exactly what calculations have been carried out, checking is effected visually by comparing the figures and operations printed on the tally strip with the dimensions.

The main disadvantage is that normally all calculations, squarings, etc., are divorced from the dimension sheets to which they belong as they are printed on a separate tally strip. As, on a job of any size, the tally strips are voluminous, difficulty has been experienced in making quick reference to the answers to squarings, etc. However, there are various ways of overcoming this difficulty and, I think, with more experience it will cease to have any material significance.

British Construction Work Overseas

Executed Work Increases in 1960-61, But New Contracts Fall

THE MINISTRY OF WORKS announces that in the twelve months ended March, 1961, British contractors carried out construction work overseas to the value of nearly £135m., an increase of £11m. compared with the previous twelve months. The work was carried out in 63 different countries by more than 60 firms.

New contracts obtained during the period fell by some £33m. compared with the previous year and the total of £98m. was the lowest figure since 1955. It is almost certain that the cost of building overseas has risen over the past six years and therefore the figure, compared with previous years, probably reflects a more substantial decrease than the figures taken at their face value show.

Contributing Factors

A number of factors have contributed to the fall in the value of new contracts obtained, state the Ministry. The unsettled political climate in many parts of the world has probably had some effect on the willingness of our contractors to tender and pressure of work at home has limited the capacity of some firms to accept additional overseas commitments. Competition for overseas civil engineering contracts is growing, particularly from industrialised countries who value the opportunities which such contracts create for their exports of heavy engineering goods. The award of these contracts is often linked with the provision of long-term credit to finance their execution; this is a field in which our ability to lend more is limited by our balance of payments situation.

The improvements to the facilities offered by the Exports Credits Guarantee Department, introduced over the last twelve months, should assist United Kingdom contractors to offer prices and credit terms which compare favourably with their competitors both in Europe and North America. Moreover the recently announced economic measures, by reducing the pressure of home demand, should encourage contractors to devote more of their energies to overseas markets.

It is to be hoped that, in consequence, we shall secure an increased share of the ever-growing volume of development work which is being undertaken overseas.

The following table gives an analysis of the work done by British firms working overseas during the last two years:

Contracts were secured by British contractors last year in a number of countries where there had been no previous reports of activity since the inquiry started in 1955. For example, contracts have been obtained in the Philippines, Yugoslavia and the USSR. Contractors John Brown Ltd. obtained a contract to design, provide materials and supervise the construction of chemical plants in Russia at Volgadonsk and Shebekino, and two other chemical plants in other parts of the country. This firm has also continued work in Persia, where the construction of sugar and fertiliser factories is being undertaken.

Richard Costain Ltd., through overseas subsidiaries, are engaged on a variety of work overseas. They have just completed an office block at Salisbury, Southern Rhodesia, which is claimed to be the tallest building in Central Africa, and a £4m. deep water harbour at Barbados.

Taylor Woodrow Ltd. have been engaged on the building of shops, office blocks, hotels, houses, banks, roads, etc., in many parts of the world. Among their many projects is a £2m. earth dam in Guma Valley in Sierra Leone, for which the consulting engineers are Howard Humphreys and Sons, and a modern departmental store at Ibadan in Western Nigeria in which will be incorporated the first escalators in the town.

'Package' Mill for Thailand

Another interesting project is the supply of a complete 'package' jute mill in Bangkok using standard industrial components made by members of the Arcon Group in Britain. Members of the group include Crittalls, Imperial Chemical Industries, Stewarts and Lloyds and United Steel. James Mackie and Sons, of Belfast, will supply the machinery and the English Electric Company will supply the electrical equipment under separate contracts.

John Mowlem and Company Ltd. completed the parliamentary building of Uganda which was officially opened by the Colonial Secretary in September last year. The Chamber is modelled on that of the House of Commons in Westminster which John Mowlem rebuilt in 1950. Marples Ridgway and Partners are the contractors for a £6m. textile mill which is being built in Khartoum. Competition for this contract was worldwide.

Other overseas activities of interest include the export of a steel structure to support the cinema screen of Trinidad's third 'drive in' cinema at Point Fortin. The complete structure has been designed and made by Saunders and Forster in Barking, Essex, a member of the Chamberlain Group. Williams and Williams, the metal window manufacturers, completed a contract for the wall cladding of the new city hall at Jacksonville, Florida. Walling panels were assembled at their works in Chester and tested in their own wind tunnel with wind pressure simulating hurricane conditions. Shortly afterwards the installation successfully weathered the hurricane 'Donna' which swept the area. Baker Perkins secured a contract for plant to handle and store flour in bulk in a Moscow bakery. The Pakistan Water and Power Development Authority awarded a contract at £1m. to Hunting Technical Services for the investigation and design work connected with development in the Indus Valley.

The Consortium of Local Authorities Supply Programme (CLASP) which is a voluntary association of local and public authorities using a method of building based upon rapid on-site assembly of prefabricated components, chiefly for schools, has also entered the export field. Italy and West Germany have agreed to pay royalties to CLASP for technical 'know-how' in connection with the system. Work is expected to start in the autumn in both countries and it is hoped that this will lead to the export of some British building components.

	Total value in £m. of contracts obtained in year ended		Estimated value in £m. of work done in the year ended		Value of work in £m. outstanding at	
	March 31, 1960	March 31, 1961	March 31, 1960	March 31, 1961	March 31, 1960	March 31, 1961
Sterling	76	55	72	80	81	59
Dollar	40	27	33	35	29	20
Non-sterling OEEC ...	1	1	3	1	1	1
Other non-sterling ...	14	15	16	19	22	20
Total	131	98	124	135	133	100

Expenditure on Roads

Increases 'Essential,' Says BRF

TO PREVENT vehicles becoming solid masses of motionless metal all over the country, considerable increases in road programme spending are essential, says the British Road Federation.

In its September editorial, the BRF Bulletin takes the Chancellor of the Exchequer to task for using the word 'considerable' recently as a way of describing intended Government road spending—£607m. in the period ending 1966-67.

The description is hardly appropriate, for it has been known for some time that Government expenditure is to be £100m. next year, declares the editorial, which points out that the average rise each year will be much less than that over the past three years.

Because of the late start of the road programme, much leeway has to be made up, even to match present requirements. As for future needs, the annual report of the Director of Road Research says there will be 17m. vehicles in 1970 compared with 10m. now. By the same year traffic, increasing at about 8 per cent compound, will be double what it is today.

It is to meet this situation that road spending must be, in actual fact, 'considerable.'

Difficult Sewer Restoration

Freeze Technique Used After Outfall Collapse in Built-Up Area

AN UNUSUALLY COMPLEX sewer restoration scheme has been completed by Messrs. J. D. and D. M. Watson, a Westminster firm of consulting engineers. The reconstruction, by freeze technique, was carried out at a cost of approximately £220,000.

On September 2, 1957, after torrential rains the 3 ft. diameter Farnworth (Lancashire) main outfall sewer in Fylde-street collapsed and an overlying 15 in. diameter surface water sewer was broken. The roadway gradually subsided to form a crater 120 ft. long, 18 ft. wide and 12 ft. deep. Sixteen houses were so shattered that they could not be repaired, 99 were without sewerage facilities and 121 had to be evacuated, making 337 people homeless. The main outfall sewer downstream of the collapse was jammed with silt and debris for a distance of 175 yd.

While measures were undertaken to rehabilitate the area, investigations lasting four months were made into the causes of the sewer collapse. Indeed, the history of the district, with its mining activities, its hidden water-courses and soil conditions was fully probed. Twenty boreholes sunk within a radius of 300 yd. of the subsidence crater revealed a layer of predominantly silty material 20 ft. thick overlaid by 15 ft. of filling in Fylde-street. It was concluded that the prime cause of the collapse was the removal of support to the sewer by ground water movements at a point where the sewer crossed the Farnworth Hall Clough.

The nature of the ground was such that to construct a new main sewer in Fylde-street without endangering the remaining properties was out of the question. A completely new sewer was constructed in a tunnel in Hall-lane, some 300 ft. from Fylde-street and deep in the the boulder clay underlying the silty material. This sewer has an internal diameter of 6 ft. 6 in. and is 800 yd. long. The level of the upper surface of the boulder clay along the new sewer line was variable, and to ensure that there was adequate boulder clay cover above the tunnel at all times it was necessary to construct backdrop manholes with drops of 12 ft., 19 ft. and 30 ft., the latter being divided into two 15 ft. drops. These relatively deep drops were achieved by twin vertical cast iron drop pipes in the manholes, the sewage entering by means of spiral vortex chambers and discharging into a water cushion at the foot of the drop pipes.

The waterladen silty ground overlying the boulder clay, and the close proximity of houses made the sinking of one of the shafts impossible either by free or compressed air, and the ground surrounding the shaft had to be frozen for a period of 18 weeks before excavation and shaft lining could be carried down into the boulder clay.

Views before . . .

. . . and after reconstruction

Identification of Hardwoods

Card Key System Devised

THE PROBLEM of identifying timbers has been greatly simplified—if not solved—by the use of card keys devised at the DSIR's Forest Products Research Laboratory at Princes Risborough. The Forest Products Research Bulletin No. 46, published with the corresponding identification cards August 25 (HMSO, price 10s.), completes a series dealing with the identification of the commercial timbers available in the United Kingdom.

This bulletin has been produced primarily for the benefit of the trained wood anatomist with facilities for preparing thin sections of timber for examination under a microscope. The anatomical features used in the identification of hardwoods are defined clearly and concisely and illustrated by means of more than 80 photomicrographs of wood structure. The features characterising the 380 commercial timbers included in the key (representing some 800 botanical species) are set out in a form suitable for recording on a special type of perforated card. Some of the descriptions are amplified by supplementary notes and references to published work. Identification involves the sorting of the pack of prepared cards according to the features observed in the sample under examination.

To prepare the complete key nearly 900 cards are necessary because many of the timbers require more than one card. Some users may wish to confine their interest to the timbers of a restricted group, for example the timbers of a particular industry or from any one part of the world, and in such cases relatively few cards need be prepared. The cards are obtainable from HM Stationery Office price 3d. each or 21s. per 100—larger quantities are available at bulk prices.

New York Island Community

Transformation of Large Stretch of Waste Land

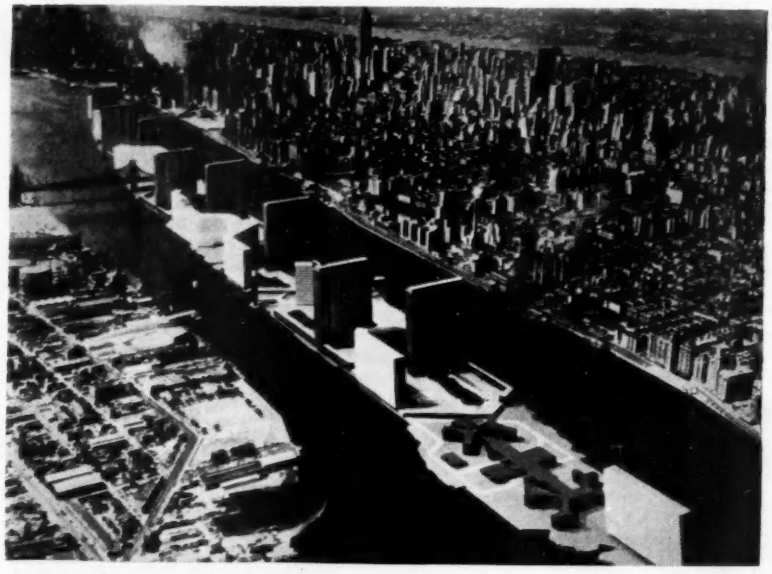
FROM OUR NEW YORK CORRESPONDENT

WITHIN METROPOLITAN NEW YORK a new city is going to be built, and the plans are unusually imaginative and daring. It is a $450m. plan to convert Welfare Island from a largely unused and wasted two-mile stretch of land into a large modern residential community. The plan envisages the transformation of the 167-acre island in the East River into a community of 20,000 apartments, providing housing for 70,000 persons. Most of the apartments would have two or three bedrooms, (besides living-room, kitchen and bath), with a smaller number of one-bedroom and efficiency apartments.

The proposers of the new project, to be known as 'East Island Community,' are Mr. Fredrick W. Richmond, financier and industrialist, who conceived the basic idea for East Island ; Mr. Victor Gruen, architect and city planner, who created the planning concept ; and Mr. Roger Stevens, a real estate developer. Their efforts have proceeded with the full knowledge of the mayor of New York City and city authorities who have called the plan 'imaginative and daring.' The plan includes the construction of a solid concrete platform 22 ft. above the ground and covering almost the entire island. Under this platform are located, in addition to mechanical equipment, storage and services, public utilities. These will include schools with windows facing toward the East River, public libraries, police and fire stations, all types of stores for daily shopping needs, cinemas, professional offices, etc. They are interconnected by a wide, air-conditioned pedestrian concourse, which also contains the internal electrical transportation system on the balcony.' This transportation system is of the 'carveyor' type and permits residents to travel in about seven minutes from one end of the community to the other.

For the internal transportation of furniture, merchandise, garbage and other loads, there is a goods handling system in the form of a moving conveyor belt. This starts from a service distribution centre near the bridge across Welfare Island (Queensborough bridge) and connects all service lobbies and storage areas. Residential structures of varying height, shape and character will rise from the top of the platform. These include 50-storey apartment towers, structures with an undulating floor plan which vary in height from 8 to 30 floors, and 4-storey duplex town house structures along the rim of the platform.

The buildings are placed in such a manner as to achieve optimum vistas over the colourful East River scene and toward the skyline of Manhattan. The apartments will be provided with balconies, terraces and bay windows. The generous spaces between the buildings located on top of the concrete platform are reserved for pedestrians and emergency vehicle use. They are richly landscaped and pro-



Model of proposed development on Welfare Island. In the background is the New York skyline

Above: The electric transportation system proposed for the island. Below: Transportation system and pedestrian precinct below the concrete platform

vide recreational and sports facilities, such as swimming pools, tennis courts, sun terraces, outdoor restaurants, sitting areas, etc. The two hospitals on the island will be preserved.

Transport Facilities

No private automobiles are permitted on the island. The transportation methods include subway transportation by means of a new station constructed above the 53rd-street line of the independent subway; bus transportation and a moving sidewalk on the Queensborough bridge which is reached by elevators from the island level; modern ferry boat service; a taxi terminal; and for those residents who wish to own automobiles, large garage facilities constructed on the Queens side of the existing bridge.

The object of the East Island Community is designed to bring middle income families with children back to Manhattan (its population during the last ten years, has decreased by approximately 270,000) by offering them a superior environment free of traffic dangers, and with rental or co-operative apartments within their budgetary capabilities. East Island has cheaper construction costs than Manhattan because the building site is surrounded by water on all sides and because of the unusual size of the project. Mass production and prefabrication methods can be employed. Since the area does not face the building problems of Manhattan (time loss through transportation by truck in traffic-congested areas; need for storing building materials; restrictive influence on construction progress imposed by shortage of space), savings amounting to 15 to 20 per cent might result from the building methods proposed for the East Island Community.

Hospital Floor Seals

Interim Report of Experiments with Ward Floors

HOSPITAL AUTHORITIES in many different parts of the country are at present investigating various problems of flooring and floor maintenance and much useful information is being collected. King Edward's Hospital Fund for London is sponsoring some investigations in this field, and a report by its Division of Hospital Facilities, published in the February issue of 'The Hospital,' describes trials that are being conducted at St. Peter's Hospital, Chertsey, with floor seals and polishes in hospital wards. Since by their nature a full assessment of the results of the trials can only be made after a fairly long period, the report is intended only to indicate the progress to date.

The experiment covers eleven floors in wards where acute general patients, including male and female, medical and surgical, are accommodated. Traffic conditions in each ward are not identical but they are reasonably comparable from the point of view of the investigations. The threefold purpose of the investigations at St. Peter's Hospital is: (i) to study some of the problems involved in the initial treatment, maintenance and re-treatment of sealed floors in hospital wards; (ii) to try to assess the advantages and disadvantages of different types of seal and polish; and (iii) to compare the maintenance procedures for sealed floors with the procedures required for the maintenance of floors by more conventional polishing methods.

Results of the Investigations

The progress of the investigations so far can briefly be summarised as follows:

(i) The investigations have confirmed the well-known principle that the preparation and initial treatment of any floor is vital, and with sealed floors in particular it is essential that the wood be properly seasoned before the seal is applied.

(ii) To judge from the experience at St. Peter's Hospital, the routine daily maintenance of sealed floors is simpler and swifter than that of polished floors, with a probable reduction in noise, disturbance and cost.

(iii) The sealed floors are at least as attractive as the polished floors.

(iv) With the maintenance methods and materials used, there has been no problem of slipperiness with any of the floors, sealed or polished.

(v) All the seals, apart from the oleo-resinous type, lasted at least a year before re-treatment became necessary.

(vi) In almost every case the smell alone of the seals precluded the re-treatment of a sealed floor in an occupied ward, quite apart from the other practical difficulties involved.

(vii) If wards are closed at regular intervals of a year or so, it should be possible to choose a seal that will last for the appropriate length of time; alternatively, occasional application of emulsion polish can prolong the life of the seal until the ward is closed.

(viii) The re-treatment of sealed floors requires varying degrees of skill according to the type of seal used, and this factor, together with the length of life required of the seal, should be taken into account when deciding what type of seal to choose initially.

(ix) Costs of seals vary considerably, but whatever the type used, it appears that the cost of initial application and subsequent re-treatment will be more than offset by the savings on daily maintenance as compared with polishing methods.

(x) The progress of the investigations does raise the question whether in fact wooden floors are among the most suitable for hospital wards.

Summing up the conclusions which may be drawn and bearing in mind that the investigations are by no means complete the report states that there are a great many different seals and polishes available. It would therefore be both unfair and unwise to attempt to draw any dogmatic conclusions from the limited trials at St. Peter's Hospital. Nevertheless, sufficient experience has been gained from these investigations to enable some assessments to be made and to indicate some of the trends that may be worth further investigation.

Preparation and Initial Treatment

It is already well-known that the preparation and initial treatment of any floor is of vital importance for its successful maintenance and subsequent appearance, and the trials at St. Peter's served well to confirm this principle. So far as sealed floors are concerned, it is clearly essential that the wood blocks should be properly seasoned before the seal is applied. Most sealed floors appear to have a tendency towards cumulative movement, and if the moisture-content of the blocks is not at the appropriate level when the seal is applied, the subsequent movement of the blocks may cause serious trouble. The danger is less, but not negligible, in the case of unsealed floors.

With the polished floors, the application of the initial coat(s) of button-polish or penetrating oleo-resinous seal required care, but could be carried out by staff with no very special training or experience. The same could be said concerning the application of the oleo-resinous and one-can plastic seals for the sealed floors. The application of the two-can plastic seals, however, did generally seem to require much greater skill and care, and it is evident that it is usually advisable for such seals to be applied either by the manufacturer's own staff or by people with special training and experience in this field.

Maintenance

To judge from the experience, the routine daily maintenance of sealed floors is a much simpler and swifter procedure than that of polished floors. This is a factor of particular importance in hospital wards, which are occupied 24 hours a day for perhaps years on end, and where the tempo and intensity of medical and nursing activity is nowadays often so great that there is little time to spare for lengthy and uninterrupted cleaning procedures. Of equal importance is the fact that the simpler and swifter the procedure, the less noise and disturbance caused to the patients themselves. On all these counts, the sealed floors appeared to have decided advantages over the polished floors in these hospital wards.

However, the special considerations that concern the maintenance of ward floors do not necessarily apply to other parts of a hospital, and a separate assessment would need to be made of the relative merits of sealing and polishing wood block floors in other departments. Similarly, the polishing methods used were those recommended by the machine-manufacturers concerned and it could be argued that other methods might have produced more favourable results for fewer man-hours of work. It certainly cannot be claimed that the experiments at St. Peter's have covered all possible polishing procedures.

With most of the sealed floors, maintenance consisted of daily vacuum-cleaning, with damp-mopping regularly once a week, and at other times when required

for undue soiling or spillage. With such methods the seal naturally becomes gradually worn away by the traffic over it. In one case, the seal was treated periodically with a resin emulsion polish which served to prolong the life of the seal considerably; the daily vacuum-cleaning process provided all the burnishing required, so that no polishing-machines were needed on the ward concerned. This procedure did add a very slight amount to the overall labour and material costs for maintaining the floor (though these costs were still far lower than for the other polished floors), but it did have the great advantage of prolonging the life of the seal until the ward could be conveniently closed for re-treatment of the floor.

On the three polished floors, a water emulsion polish was used in one ward and hot-sprayed spirit-based wax polishes in the other two. The man-hours required for maintenance by these means were not very different, totalling 13-14 man-hours per ward per week, as compared with 8 man-hours on the sealed floors. Unlike the spirit-based waxes, the water-emulsion polish required no prior heating; it was also easier to apply and caused less trouble if accidentally over-applied, whilst the results obtained from all three polishes were broadly comparable.

Improvements in Polishes

Improvements in polishes are taking place fairly rapidly, and it seems likely that the development of self-burnishing emulsion polishes may reduce to a minmum the need for the use of polishing-machines. From the viewpoint of hospitals, if not of the machine-manufacturers, progress in this direction would be most desirable; maintenance routines would be greatly simplified, and the patients' stay in hospital would be less noisy and disturbed. The incorporation of bacteriostatic or bactericidal agents in polishes is another matter in which further research may be useful.

So far as St. Peter's Hospital is concerned, comparisons of the appearance of the sealed and polished floors need to be made with caution. Until the seals wore through, the sealed floors looked more attractive than the polished floors, but in the case of two at least of the polished floors this may well have been due to troubles over their initial treatment. Nevertheless, it seems fair to say that sealed floors are at least as attractive as polished ones, for as long as the seals last. In none of the wards, sealed or polished, were there any complaints about slipperiness.

The oleo-resinous seal lasted the shortest time, and generally speaking the two-can plastic seals looked as if they would last longer than the one-can types, to judge from their relative condition at the end of one year. Apart from two oleo-resinous types, all the seals used at St. Peter's would seem to have a life of at least a year in average ward conditions, particularly if three coats of seal are applied initially.

In relation to hospital wards, perhaps the principal, if not the only, advantage of the use of conventional polishing methods is that they do not involve the major upheaval and disturbance that almost inevitably accompany the periodical re-treatment of sealed floors. This is a factor that cannot be lightly disregarded in hospital wards. Floors in offices, dining-rooms and other departments can usually be re-treated when not in use overnight or at week-ends or holiday periods. Hospital wards, on the other hand, are generally in full use for months or years at a time, and their floors cannot be re-treated so simply. With few exceptions, the smell alone of the seals precludes their application in an occupied ward; apart from that, the time taken for the cleaning-off of the worn areas (almost invariably the busiest parts of the ward, such as the main entrance) and for the application and drying-out of the fresh coat(s) of seal means that it very seldom seems practicable to re-treat a sealed floor in an occupied ward.

This is a definite, but by no means insuperable, disadvantage of sealed floors in wards. Where there is a programme for the regular closing of wards at annual or other periodical intervals, then it may well be possible to use a seal whose life will be at least as long as the interval between each closing of the ward. Alternatively, it is possible to treat the seal periodically with an emulsion polish that will help to prolong the life of the seal until such time as the ward can be closed. Either way, the re-treatment of the floor can then be effected when the normal time comes round for the closing of the ward.

The re-treatment of sealed floors required varying degrees of skill according to the type of seal used. As has been mentioned earlier, floors with oleo-resinous seals can generally be cleaned off quite simply with wire-wool and detergent (as recommended by the manufacturers), and fresh coat(s) applied by relatively unskilled labour. Floors with one-can plastic seals may require sometimes, but not necessarily always, the use of a light sanding-machine after cleaning and such machines obviously require skilful handling if the floor itself is not to suffer damage; the re-application of this type of seal is again work that can be done by careful, but not necessarily highly-skilled, staff. Floors with two-can seals will often require the use of sanding-machines, and the re-application of the seal requires greater care and skill than is the case with the other types of seal.

Cost and Choice

Of the limited number of polishes used in the trials at St. Peter's (two spirit-based wax polishes and one water emulsion polish) the emulsion polish was easier to apply and less likely to cause trouble if over-applied. As regards cost, it is difficult to make any precise comparisons between the costs of the different polishes used, partly because of the initial trouble on two of the floors and partly because of the relatively limited nature of the trials. There were certainly no dramatic differences in cost as between the three types of polish used.

For the hospital that has decided to use seals, the choice of the particular type to be used seems to depend upon two main factors:

(i) *The length of life required of the seal.* This is largely determined by the hospital's policy concerning the closing of wards. If the wards (or self-contained sections of each ward) are closed regularly each year, then a seal with a life of 12-15 months should be adequate. Where the wards may not be closed for 2-3 years or more, then a longer-lasting seal would clearly be preferable. Generally speaking, the oleo-resinous seals have the shortest length of life, whilst most of the two-can plastic seals have a longer life than the one-can plastics. Periodical application of an emulsion polish may prolong the life of any of these seals, but application would have to be more frequent (and hence more costly and disturbing) on the less long-lasting seals.

(ii) *Availability of staff for re-treatment.* As has been mentioned, varying degrees of care and skill are required for re-treating floors sealed with different types of seal. The individual hospital needs to determine whether re-treatment can be effectively performed by its own staff or whether the work is to be done by outside contractors. A hospital in a remote area, for instance, might find it difficult and costly to have two-can plastic seals re-applied by outside contractors at the particular time convenient to the hospital.

Precise Cost Comparisons Not Available

No precise comparisons of cost are obtainable from the trials at St. Peter's because such comparisons depend largely upon the length of life of each seal; at St. Peter's, some of the sealed floors were deliberately re-treated before the seal had worn through. The costs of different seals do in fact seem to vary considerably, and it does not necessarily seem to be the case that the longer-lasting seals are always more expensive than the others. At this stage, the development of floor seals is to a certain extent still in the experimental stage and there are no clear standards whereby to assess the merits of different types of seal as regard such factors as percentage of solids, lasting qualities, etc.

At St. Peter's, the cost of the seals varied from £12 to £40 per ward (each approx. 280 sq. yd. in area), with the majority coming within the range £25-£30 for three coats of seal, excluding labour costs for preparation and application. On the polished floors, the cost of the two different oleo-resinous seals initially applied were about £8 (for 2 coats) and £12 (for 1 coat) respectively. So far as the individual hospital is concerned, it would certainly seem prudent to obtain quite a wide range of competitive quotations before finally choosing any one type of seal.

With newly-laid wooden floors, the initial preparation prior to the application of seal or polish is basically much the same in each case, and the differences in prime costs between sealed and polished floors will depend upon the actual type of seal used and the number of coats applied. Detailed comparisons of cost are perhaps of more significance in relation to subsequent maintenance and re-treatment costs. In this connection approximate calculations, based on

Whitley Council rates of pay for domestic staff and Ministry contract prices for polish, indicate that the costs for the the maintenance of each of the sealed floors at St. Peter's (eight hours' labour per week; no polish) are about £50 per year cheaper than those for the polished floors (13-14 hours' labour per week, plus polish). By February, not all the sealed floors had been re-treated, but the prices already paid, or quotations accepted, indicated that the total cost of re-treatment would vary between £28 (for cleaning off floor and application of one further coat of one-can plastic seal, expected to last about one year) and £58 (for cleaning off floor and application of two further coats of two-can plastic seal expected to last about two years). These re-treatment costs are for seals applied by outside contractors: the costs would doubtless be lower if the work was performed by the hospital's own staff. For two floors originally polished and later sealed, the total costs for cleaning off the polish, preparing the floor and applying the coats of seal were £68 and £81 respectively: subsequent re-treatment costs should be much the same as for the other sealed floors just mentioned.

Whatever the type of seal used, it does seem that in wards the costs of initial application of the seal and subsequent re-treatment will be more than offset by the savings on daily maintenance. On grounds of cost alone, therefore, the use of seals on wood block floors would seem to be justified. The trials at St. Peter's Hospital have been concerned only with wood block floors, but investigations elsewhere indicate that the same considerations may apply to floors of cork and of wood strip or board, and probably to floors of linoleum as well. Costs are important, but of no less significance is the fact that the maintenance routines for sealed floors seem much swifter and less disturbing than those for polished floors, and this enhances greatly the advantages of sealed floors from the point of view of the comfort and convenience of patients.

Wood Block Floors

The decision to use wood block floors in the eleven wards at St. Peter's was taken before these trials were planned, and among other things the progress of investigations raises the question whether in fact wooden floors are generally among the most suitable types of flooring for use in hospital wards.

Cracks, crevices or gaps are almost inevitable in the joints in any wooden floors —particularly in board floors and to a lesser extent in floors of hardwood strip or block. Such floors are therefore perhaps bound to be suspect as possible collecting-grounds for dust, dirt or bacteria, though sealing probably lessens this danger. Some authorities favour a technique that involves the regular weekly or periodical use of a liquid bactericidal solution on ward floors, and if such a procedure is used on any wooden floors, sealed or not, it seems more than likely that it will eventually have a harmful effect on the floor.

For these reasons, it seems debatable whether wooden floors, despite their attractiveness and long-wearing qualities, should continue to be widely used for hospital wards. Opinions vary on this controversial matter and further research is needed. Meanwhile, it certainly seems to be the case that, in new and old hospitals alike, many wards are now being provided with floors of linoleum, vinyl asbestos or rubber tiles or sheeting. Increasing interest is also being shown in floor coverings such as polyvinylchloride in sheets welded together to provide a completely smooth and jointless surface.

As part of the next stage of the investigations the Fund is paying for the installation of a floor of this type in another ward at St. Peter's. In America and Germany, pvc flooring has been developed which is claimed to incorporate ingredients that render the material permanently bacteriostatic, and even bactericidal, whilst in this country, and elsewhere, research is in progress to see whether similar ingredients can be successfully incorporated in the polishes or dressings applied to floors. Progress is taking place rapidly in all these fields, and the investigations at St. Peter's Hospital touch upon but a few of the aspects of a very wide problem: they will have served their purpose if they make some contribution to the pool of knowledge on the subject, and help to stimulate further discussion or research.

MATERNITY HOSPITAL, PORT-OF-SPAIN.—*The southern side of the new £250,000 150-bed Maternity Hospital at Port-of-Spain, Trinidad, which was recently completed to the design of Messrs. Devereux & Davies, the London architects. The quantity surveyors were Messrs. Clarke, Nicholls & Marcell, of Port-of-Spain, and the main contractors were Holland & Hannen and Cubitts (Trinidad) Ltd., of Port-of-Spain*

Future Homes Made of Plastics?

'Expected in '80s' Says US Expert

WHOLE HOUSES in the US will be constructed of plastics by the 1980s predicts a leading plastics specialist. 'Home builders are now using many plastics in construction, and in the future—by the 1980s—whole houses will be built with plastics and chemicals,' according to Charles Ludlow of Allied Chemical's International Division. 'Advancements made with chemicals and plastics in the past 15 or 20 years indicate that continued progress will result in many dramatic new techniques in home construction,' he says.

Mr. Ludlow cites an experimental building constructed by US Army engineers at Ft. Belvoir, Virginia, as a practical example. The building, about the size of a two-car garage, was constructed of plastic panels, moulded and shaped from foam sprayed from a 55-gallon barrel. It was reinforced by spraying it with polyester and when completed weighed about 550 pounds—or less than half as much as a compact European automobile.

'There will come a day when houses such as this will be poured from a barrel,' Mr. Ludlow thinks. 'Buyers will select a site and then order barrels of chemicals for on-the-spot moulding into the panels that will be used in the basic structures of the houses.'

Other building materials made of plastics that have already received wide attention. Among them are polyethylene cold water piping; plastic sewerage pipes, translucent plastic panels for industrial skylights, windows, room dividers, shower stalls and cars ports.

THE BUILDER CURRENT PRICES

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchant's warehouse will necessarily be higher so as to include the stocking and handling costs involved. It is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

		£	s.	d.
Pit Ballast	per yd.	1	5	5
Pit Sand	"	1	3	8
Washed Sand	"	1	6	9
¼ in. Shingle	"	1	4	3
¼ in. Broken Brick	"	1	0	9
Pan Breeze	"	1	5	0
Fine or Coarse Foamed Slag Aggregate 2 yds. of fine and 2.6 yds. of coarse per ton.	per ton	3	8	0

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

		£	s.	d.
Best British Portland Cement. Standard Specification delivered Charing Cross area.				
8-ton loads and upwards, site	per ton	5	16	0
Below 8 tons down to 4 tons, site	"	6	8	0
Below 4 tons down to 2 tons, site	"	6	12	0
Below 2 tons down to 1 ton, site	"	6	14	0
Rapid-Hardening Cement in 8-ton loads and upwards to site	"	6	6	6
Below 8 tons down to 4 tons, site	"	6	18	6
Below 4 tons down to 2 tons, site	"	7	2	6
Below 2 tons down to 1 ton, site	"	7	4	0
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.				
Sulphate Resisting Cement. 32s. 6d. per ton on ordinary cement prices.				
Red, Buff or Khaki Colocrete in 8-ton lots	"	8	16	0
Other colours according to colour. In 4-ton lots from 313s. 3d. to 783s. 3d. per ton.				
White Portland Cement	"	14	0	9
Under 1 ton	per cwt.		17	0
417 Cement (Ultra Rapid Hardening) in 8-ton lots and upwards	per ton	7	8	6
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.				
Cullamix Tyrolean Finish, £11 13s.3d. to £14 8s.3d. (1-ton loads and upwards).				
Ciment Fondu and Lightning Brands High Aluminous cement, 6-ton lots and up	"	15	14	6
Stourbridge Fireclay, 6-ton loads at Railway Depot, London	"	6	19	0
Stourbridge Fireclay, 6-ton loads (London sites)	"	7	12	0
Moler Mortar Powder for Flue Bricks (London sites)	per cwt.	1	6	0

BRICKS

Full Loads		£	s.	d.
First Hard Stocks	per 1,000	16	19	6
Second Hard Stocks	"	14	18	6
Mild Stocks (Kiln Burnt)	"	11	5	0
Mild Stocks	"	11	0	0
All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.				
2½ in. Nominal Fletton Bricks to sites in W.C. district :				
Commons	"	6	12	0
Cellular Commons	"	6	12	0
Keyed do.	"	6	14	0
Rustics	"	8	12	0
Cellular Rustics	"	8	12	0
Single Bullnose Commons	"	8	14	6
Sandfaced	"	9	12	0
Tuscans	"	10	7	0
Saxons	"	10	15	0
Golden Buffs	"	11	2	0
Dapple Light Facings	"	11	9	6
Heather Facings	"	11	5	0
Best Blue Pressed Staffs (London sites)	"	34	0	6
do. Bullnose (London sites)	"	34	19	6
Blue Wire Cuts (London sites)	"	29	19	6
Midhurst Lime Bricks (London sites)	"	11	13	0
Uxbridge Whites (London sites)	"	12	3	6
Special Purpose Sandlime Bricks (London sites)	"	9	2	0
Best Stourbridge Fire Bricks :				
2½ in. (London stations)	"	32	14	0
2½ in. (London sites)	"	33	2	9
3 in. (London stations)	per 1,000	39	4	6
3 in. (London sites)	"	39	15	0
2½ in. Moler Flue Bricks (London sites)	"	31	0	0
2½ in. Machine-made Sandfaced Red Facings (London sites)	"	18	19	0
2½ in. Machine-made Multi Red Facings (London sites)	"	19	4	0
2½ in. Hand-made Sandfaced Red Facings (London sites)	"	20	17	6
2½ in. Hand-made Sandfaced Multi-Colour Facings (London sites)	"	20	17	6
Hand-made Sandfaced Cherry Red Facings, Berkshire district (London sites)	"	21	5	0
Hand-made Sandfaced Multi-Colour Facings, Berkshire district (London sites)	"	21	5	0
Rubber Bricks for gauged arches (London sites)	"	52	5	0
2½ in. Surrey Clamp Burnt Multi Stock Facings (London sites)	"	16	15	0
2½ in. Surrey Kiln Burnt Multi Stock Facings (London sites)	"	18	7	6
Glazed Bricks (London sites), White, Ivory, Brown:				
Stretchers	"	64	0	0
Headers	"	63	0	0
Quoins, Bullnose and 4½ in. Flats	"	80	0	0
Double Stretchers	"	85	0	0
Double Headers	"	77	10	0
One side and two ends	"	87	0	0
Two sides and one end	"	89	10	0
Splays and Squints	"	83	0	0
Cream and Buff, £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 47½% for Best quality and plus 47½% less 10% for Second quality.				

PARTITION SLABS, etc.

Delivered Central London Area. (W.C. District).

Hollow Clay Partition Blocks (Keyed) Minimum lorry loads		£	s.	d.
*2½ in. 140 yds.	per yd. sup.		4	7
Building Blocks (Keyed)				
*3 in. (6 cavity) 110 yds.	"		5	9
*4 in. (6 cavity) 90 yds.	"		7	3
6 in. (8½ in. × 5½ in.) 1,250 blocks	per 1,000	28	9	0
* Half blocks at no extra charge.				
Clinker Concrete				
2 in. 100 yds.	per yd. sup.		4	0
2½ in. 85 yds.	"		4	7
3 in. 75 yds.	"		5	8
4 in. 55 yds.	"		7	0
Cranham Terra Cotta				
2 in.	"		7	5
2½ in.	"		8	4
3 in. Load bearing quality	"		9	6
4 in. do. do	"		11	6
Moler Partition Blocks				
2 in. 150 yds.	"		12	9
2½ in. 120 yds.	"		13	9
3 in. 100 yds.	"		14	9
4 in. 90 yds.	"		17	0
Lightweight Concrete Building and Partition blocks of Various Sources of Manufacture				
2 in. 100 yds.	per yd. sup.		5	4
2½ in. 80 yds.	"		6	5
3 in. 65 yds.	"		7	5
4 in. 50 yds.	"		9	4
4½ in. 44 yds.	"		10	2
6 in. 33 yds.	"		14	5
Thermalite-Ytong Partition Blocks				
2½ in. 144 yds.	"		7	0
Thermalite-Ytong Load-Bearing Insulating Blocks				
3 in. 120 yds.	per yd. sup.		8	5
4 in. 90 yds.	"		11	0
5 in. 72 yds.	"		13	9
6 in. 60 yds.	"		16	6
8½ in. 42 yds.	"	1	3	8
Floor Blocks and Filler Tiles				
Floor Blocks 12 in. × 12 in. delivered in full lorry-loads :				
3 in.	per 1,000	35	14	0
4 in.	"	38	9	0
5 in.	"	46	1	0
6 in.	"	52	12	0
7 in.	"	64	12	0
8 in.	"	75	9	0
9 in.	"	83	2	0
10 in.	"	92	0	0
Filler Tiles in multiples of 10 tiles per 1,000 multiples :				
12 in. × 3 in. × ½ in.	"	43	13	0
12 in. × 4 in. × ½ in.	"	75	7	0
10 in. × 5 in. × ½ in.	"	75	7	0

STONEWARE DRAIN PIPES, etc.

Glazed Stoneware Standard List (November, 1956).

		4 in.	6 in.	9 in.
Pipes, 2 ft. lengths	per ft.	1/8	2/6	4/6
Bends	each	5/–	7/6	20/3
Junctions	„	8/4	12/6	27/–
Gullies with 4 in. outlets	„	12/6	13/9	22/6

The following are the percentages to be added to the Standard List (November, 1956) prices delivered London Area.
Delivered ex Merchants Wharf or Depot.

	Over 2 tons NET	Over 100 pieces Under 2 tons	Under 100 pieces Under 2 tons
Best Quality ...	NET	+22½%	+27½%
BSS Best Quality...	+10 % NET	+10 %+22½%	+10 %+27½%
Tested Quality ...	+37½% NET	+37½%+22½%	+37½%+27½%
BSS Tested Quality	+47½% NET	+47½%+22½%	+47½%+27½%

	£	s.	d.
3 in. Land Drain Pipes (in 12 in. lengths) ... ... per 1,000	12	10	6
4 in. do. do. ... ... „	16	16	0
6 in. do. do. ... ... „	34	10	0
9 in. do. do. ... ... „	64	19	0

DAMP COURSE

	£	s.	d.
Hessian base bitumen 7 lb. per yd. sup. in 24 ft. rolls cut to wall widths in lots of £6 value and over delivered London area ... ... per yd. sup.		3	5
Asbestos base do. 7 lb. per yd. sup. do. do. „		5	2
Lead lined bitumen do. 9½ lb. per yd. sup. do. do. „		12	2
18 in. × 9 in. Brftish damp course slates ... ... per 1,000	43	8	11
14 in. × 9 in. do. do. ... ... „	32	8	2
9 in. × 9 in. do. do. ... ... „	18	18	9
18 in. × 4½ in. do. do. ... ... „	19	19	9
14 in. × 4½ in. do. do. ... ... „	15	18	3
9 in. × 4½ in. do. do. ... ... „	10	14	3

STONE

	£	s.	d.
Bath Stone			
Monks Park ... ... per ft. cube		10	3
St. Aldhelm Box Ground ... ... „		11	6
Delivered in railway trucks at South Lambeth B.R. Western Region.			
Doulting Stone Random Blocks. Delivered London area ... ... „		10	10
Beer Stone. Delivered London area ... ... „		10	6
Portland Stone—			
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region ... ... „		9	10
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.			
9 in. × 3 in. Rubbed, weathered, throated and stolled cills ... ... per ft. cube	4	5	10
12 in. × 6 in. do. do. do. ... ... „	3	1	2
12 in. × 3 in. Plain coping, twice throated ... ... „	2	7	6
12 in × 3 in. Weathered and twice throated coping „	3	3	3
14 in. × 6 in. do. do. do. ... ... „	2	17	0
4½ in. × 9 in. Plinth rubbed on top and face ... „	2	11	0
3 in. sawn two sides Slabs, random sizes ... ... per ft. sup.		9	1
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ... per ft. cube	1	11	3
do. do. fair one edge for fair faced brickwork „	1	17	0
Hard York—			
12 in. × 2 in. Square Steps, rubbed on top and edge ... ... per ft. run		11	0
14 in. × 3 in. Round-nosed Steps, rubbed on top and front ... ... per ft. cube	2	18	3
12 in. × 6 in. Plain Steps, rubbed top and front „	2	11	0
2 in. Rubbed and Jointed Paving, given sizes ... per ft. sup.		10	3
2 in. Sawn Paving, edges squared, in random sizes ... ... per yd. sup.	3	12	0

TILES AND PANTILES

Delivered London area by road in 6 tons or over per 1,000.

	£	s.	d.
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	35	16	6
Hand-made Pantiles Berkshire district	64	10	0
Hand-made Double Roman Bridgwater district	78	2	9
Hand-made 10½ × 6½ tiles Berkshire district	18	0	0
Machine-made 10½ × 6½ Staffordshire district	17	0	0
Hand-made Hip and Valley tiles per doz.	1	13	0
Machine-made Hip and Valley tiles do.	1	12	0
Concrete tiles 10½ × 6½	8	10	0
do. Interlocking (49S)	19	16	6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate station. Per 1,000 actual.

	£	s.	d.
24 × 12	160	4	0
22 × 12	126	15	0
22 × 11	114	15	0
20 × 12	107	5	0
20 × 10	105	0	0
18 × 10	71	5	0
18 × 9	62	14	0
16 × 10	54	15	0
16 × 8	42	18	0

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

		Ex Wharf	per standard	£	s.	d.
Softwood				£115 to £140		
Joinery quality		do.	„	£94 — £98		
Carcassing quality		do.	„	£112	0	0
1 in. Tongued and Grooved Flooring		do.	„	£	s.	d.
Hardwood						
Mahogany—	African S.E.	do.	per ft. cube	1	17	6
do.	Honduras S.E.	do.	„	3	5	0
Oak	European S.E.	do.	„	2	10	0
do.	Japanese S.E.	do.	„	3	0	0
do.	English Logs sawn ...	do.	„	2	0	0
Teak	8 in. average S.E. ...	do.	„	3	17	6
Walnut	African Logs sawn ...	do.	„	1	2	6
Plywood			per			
6 mm. (¼ in.) Birch Plywood B/BB			100 sq. ft.	4	3	6
6 mm. Israeli Gaboon do. B/BB exterior grade WBP (AX100)			„	4	5	3
18 mm. Birch Blockboard			„	9	7	0
¾ in. Douglas Fir Plywood 96 in. × 48 in. Exterior grade WPB (AX100) solid two sides			„	9	3	0

DOORS (in Lots I-II)

		£	s.	d.
Delivered London area.				
1¼ in. 4 Horizontal Panel. Pattern 4 in. deal				
2 ft. 0 in. × 6 ft. 6 in.	each	1	16	0
2 ft. 3 in. × 6 ft. 6 in.	„	1	17	6
2 ft. 6 in. × 6 ft. 6 in.	„	1	18	6
2 ft. 9 in. × 6 ft. 6 in.	„	2	0	6
2 in. do. but top panel open. Pattern 4 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	„	2	9	0
2 ft. 9 in. × 6 ft. 6 in.	„	2	11	6
2 in. 2 Panel top panel open. Pattern 2 × G in deal				
2 ft. 6 in. × 6 ft. 6 in.	„	2	3	0
2 ft. 9 in. × 6 ft. 6 in.	„	2	5	0
1¼ in. Plywood Faced Flush Doors to BS459, Part 2A				
2 ft. 0 in. × 6 ft. 0 in.	„	1	12	3
2 ft. 0 in. × 6 ft. 6 in.	„	1	12	3
2 ft. 3 in. × 6 ft. 6 in.	„	1	13	9
2 ft. 6 in. × 6 ft. 6 in.	„	1	15	3
2 ft. 9 in. × 6 ft. 6 in.	„	1	18	0
1¼ in. Hardboard Faced Flush Doors				
2 ft. 0 in. × 6 ft. 0 in.	„	1	5	6
2 ft. 0 in. × 6 ft. 6 in.	„	1	6	0
2 ft. 3 in. × 6 ft. 6 in.	„	1	6	6
2 ft. 6 in. × 6 ft. 6 in.	„	1	8	6
2 ft. 9 in. × 6 ft. 6 in.	„	1	9	6

SUNDRIES

		£	s.	d.
Delivered London area.				
1 in. Wood Wool Slabs 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton)	per yd.		6	2
1½ in. do. (67 yds. to 1 ton)	„		8	0
2 in. do. (52 yds. to 1 ton)	„		9	9½
2½ in. do. (45 yds. to 1 ton)	„		11	3
3 in. do. (39 yds. to 1 ton)	„		12	7½
½ in. imported or home produced insulation Board, quantities over 5,000 sq. ft.	per 100 sq. ft.	2	2	6
¼ in. Hardboard do.	„	1	17	6
⅛ in. do. do.	„	2	4	6
2 in. Compressed Straw Slabs, roofing quality. 6 ft., 8 ft., 9 ft., 10 ft., and 12 ft. × 4 ft.				
50–100 yds.	per yd. sup.		11	4
101–250 yds.	„		10	10
251–750 yds.	„		10	1
Over 750 yds.	„		9	4
2 in. do. for partitions 4d. per yd. cheaper.				
⅛ in. Asbestos Flat Building Sheets...	„		4	3½
¼ in. do. do. do.	„		6	0
Roofing Felt 1-ply	„		1	9
do. 2-ply	„		2	2½
Best Scotch Glue in slabs	per ½ cwt.	5	3	9
do. pearl	„	5	3	9
Croid Glue	28 lb.	2	6	0
Impact Adhesive	per gall.	2	12	0
Cut Nails 3 in. (1-ton lots)	per ton	84	10	0
do. 4 in. and up (1-ton lots)	„	81	0	0
Wire Nails 3 in. (4-cwt. lots)	per cwt.	4	2	1
do. 4 in. and up (4-cwt. lots)	„	3	19	3

METALS

STEEL JOIST, ETC.

		£	s.	d.
Basis Joists—				
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in., 12 in. × 6 in., plain cut to lengths delivered London area	per ton	47	15	0
Extra for sizes				
3 in. × 1½ in. 4 in. × 1½ in.	„	3	10	0
3 in. × 3 in.	„	2	10	0
4 in. × 3 in.	„	2	5	0
10 in. × 4½ in.	„	1	10	0
5 in. × 2½ in. 5 in. × 3 in.	„	1	15	0
4½ in. × 1½ in.	„	3	5	0
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ...	„		15	0
6 in. × 3 in. 24 in. × 7½ in.	„	2	0	0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in.	„	1	5	0
9 in. × 4 in. 10 in. × 5 in.	„			
12 in. × 5 in. 22 in. × 7 in.	„	1	0	0

METALS—*continued*

		£	s.	d.
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in. / 14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in. / 15 in. × 5 in. 15 in. × 6 in. 16 in. × 8 in. / 16 in. × 8 in. 18 in. × 6 in. 18 in. × 7 in.	per ton		10	0
18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in.	,,		10	0
Steel angles average price	,,	48	15	0
Steel tees average price	,,	49	15	0
Fabricated work delivered London—				
R.S. Joists cut and fitted...	,,	67	19	0
Compound girders	,,	72	14	3
Stanchions	,,	78	9	9
Compound stanchions	,,	83	4	3
In Roof Work—Trusses and Purlins	,,	93	19	6
Average prices not for awkward work.				
Angle cleats and ⅛ in., ¼ in. and ⅜ in. bolts average price London area	per cwt.	5	10	0

Above prices joists etc. increased by 1·1%.

Ferro-Concrete Bars and Fabric

Mild Steel Ferro-Concrete Bars British manufacture to BSS 785 ex. Mills. 1 in. diameter and upwards delivered nearest London station ...	per ton	40	10	0
do. do. ex. London Stock do. delivered London site	,,	49	10	0
Extras—				
⅛ in. diam....	per ton extra	8	12	6
¼ in. do.	,,	6	12	6
⅜ in. do.	,,	4	12	6
½ in. do.	,,	3	2	6
⅝ in. do.	,,	1	10	0
¾ in. and ⅞ in. diam.	,,		15	0

Above prices mild steel bars increased by 1·1%.

Steel wire mesh reinforcing fabric to BSS 1221A.

Ref. No. 106 ... ... 7.88 lbs.	per sq. yd.	5	2½	
,, ,, 109 ... ... 4.71 ,, ...	,,	3	0½	
,, ,, 113 ... ... 1.83 ,, ...	,,	1	8½	
,, ,, 122 ... ... 7.32 ,, ...	,,	4	10½	
,, ,, 125 ... ... 4.32 ,, ...	,,	2	10½	

Mild Steel Tubes

Tubes to BSS 1387. Fittings BSS 1740.

Basic List Prices

		⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Tubes	per ft.	9½	10	1/-	1/2½	1/9	2/3	2/8	3/9
Bends	each	1/7	1/9	2/-	2/6	3/8	5/5	6/2	10/7
Elbows, square	,,	1/8	1/10	2/2	2/6	3/-	4/4	5/2	8/6
do. round	,,	1/10	2/-	2/4	2/10	3/4	4/8	5/8	9/4
Tees	,,	2/-	2/2	2/6	3/2	3/8	5/-	6/2	10/2
Crosses... ...	,,	4/4	4/8	5/6	6/6	8/2	11/-	13/2	21/-
Sockets, Plain	,,	6	6	8	10	1/-	1/4	1/9	2/6
do. Diminished	,,	8	10	1/-	1/2	1/6	2/-	2/8	4/-
Backnuts ...	,,	4	4	6	7	10	1/-	1/4	2/2

Malleable Fittings

		⅜ in.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Elbows, round	each	8½	8½	9½	1/2½	1/8½	2/7½	3/6	5/-
Tees	,,	9½	9½	1/-	1/4½	2/-	2/9½	4/-	5/6
Crosses... ...	,,	1/2½	1/2½	1/4½	2/-	2/9½	3/7½	5/2½	7/2½
Sockets... ...	,,	5½	5½	7	9½	1/-	1/7½	2/2½	3/1½
Backnuts ...	,,	3	3	3½	4½	5½	7½	10½	1/5½

Discounts from List prices as follows :—

Galvanised Tube—

	Under 1 ton	Over 1 ton	W.I. Fittings	Malleable Fittings
Light	−37 %	−38½%	Light −24½%	Malleable List
Medium	−33 %	−34½%	Heavy −20½%	−14%+40%
Heavy	−25½%	−27 %		
Black—				
Light	−47 %	−48½%	Light −30½%	Malleable List
Medium	−43 %	−44½%	Heavy −26½%	−14%
Heavy	−35½%	−37 %		

C.I. Half-Round Gutters

Delivered London per yd. in 6 ft. lengths.

	Gutters	Nozzles	Stop Ends
3 in.	4/4½	3/10	1/1
3½ in.	4/9	4/2	1/1
4 in.	6/1½	4/9	1/8
4½ in.	6/9	5/4	2/-
5 in.	7/6	5/9	2/4

C.I.O.G. Gutters

Per yd. in 6 ft. lengths :

	Gutters	Nozzles	Stop Ends
3 in.	5/7½	5/1	1/4
3½ in.	6/3½	5/1	1/8
4 in.	6/11½	5/4	2/-
4½ in.	7/6	6/1	2/4
5 in.	8/2½	7/-	2/8

C.I. Rain-Water Pipes

	Pipes	Bends	Branches
2 in.	9/4	4/9	6/10
2½ in.	9/4	5/4	9/2
3 in.	10/6	6/8	9/11
3½ in.	11/10	7/10	11/11
4 in.	13/9½	9/6	14/2

L.C.C. Coated Soil Pipes

2 in.	10/7	8/2	9/11
2½ in.	11/2	9/1	12/4
3 in.	12/6½	9/11	14/8
3½ in.	14/−½	12/4	17/1
4 in.	15/11½	13/10	20/3

Above prices for gutters, rain-water and soil pipes for under 5-cwt. lots only. Lots over 5 cwt. see List No. 3300, dated February 1, 1955, plus 32½% and tonnage allowance. 4-ton lots 5%, 2-ton lots 2½%.

L.C.C. Coated Drain Pipes

		£	s.	d.
4 in. diameter in 9 ft. lengths	per yd. run	1	11	1
6 in. do. do.	,,	2	5	6
4 in. diameter bends	each	1	0	6
6 in. do. do.	,,	2	14	9
4 in. diameter branches	,,	1	16	6
6 in. do. do.	,,	4	7	6

Above prices for any quantity but under 5 cwt. carriage extra.

Pitch Fibre Drain Pipes

2 in. diameter in 5 ft., 5 ft. 6 in. or 8 ft. lengths including couplings	per ft. run	1	6½	
3 in. do.	,,	1	10½	
4 in. do.	,,	2	6	
5 in. do.	,,	4	1½	
6 in. do.	,,	5	0½	
4 in. diameter short radius ¼ bends	each	17	9	
4 in. do. do. ⅛ bends	,,	12	11	
2 in. diameter 6 ft. radius bends (5 ft. lengths)	,,	17	0	
3 in. do. do. do.	,,	19	8	
4 in. do. do. do.	,,	1	7	4
5 in. do. do. do.	,,	2	4	0
6 in. do. do. do.	,,	2	14	6

Above prices for loads of £60 and over.
Loads £25 to £59 19s. 11d. Plus 10%
Loads under £25 ... Plus 15%

Asbestos Rain-Water Pipes and Fittings

		2 in.	2½ in.	3 in.	4 in.
All less 17½% discount.					
Pipes, 6 ft. lengths ...	per yd.	4/7	4/10½	5/11	7/10
Shoes	each	3/-	3/3	3/10	5/2
Single Branches	,,	4/8	5/6	6/7	9/2
Bends, squares or obtuse ...	,,	3/3	3/7	4/8	6/7
Swan Necks, 4½ in. proj....	,,	3/7	4/8	5/2	7/3
do. 6 in. do. ...	,,	3/10	5/2	5/10	7/10

Asbestos O.G. Gutters and Fittings

		4 in.	4½ in.	5 in.	6 in.
Gutters, 6 ft. lengths ...	per yd.	4/4	4/9½	5/9	6/10½
Drop ends	each	3/6	4/-	4/9	5/5
Stop ends	,,	1/1	1/2	1/3	1/5
Angles	,,	3/7	4/1	5/-	5/10
Nozzles	,,	3/6	4/-	4/9	5/-
Union Clips	,,	1/9	2/1	2/6	2/11

Asbestos Half-Round Gutters and Fittings

	per	3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters, 6 ft. lengths	yd.	3/0½	3/7½	3/8½	4/4½	6/1
Drop ends	each	2/6	3/-	3/3	3/7	5/2
Stop ends	,,	1/-	1/1	1/2	1/3	1/5
Angles	,,	2/10	3/3	3/7	3/10	5/2
Nozzles	,,	2/6	3/-	3/3	3/7	5/2
Union Clips	,,	1/3	1/4	1/5	1/7	2/5

	Per ton basis in London £	s.	d.
Iron—Staffordshire Crown Merchant Quality	52	17	6
Mild Steel Bars	47	18	0
Mild Steel Hoops	49	10	0

	Ex Merchant's Stock per ton Two-ton lots £	s.	d.
Soft Sheets C.R. and C.A.—			
20 gauge	63	0	0
24 gauge	65	10	6
26 gauge	68	11	0
Galvanised Corrugated Sheets, 6-ft. to 9-ft.—			
20 gauge	70	18	0
24 gauge	74	9	0
26 gauge	79	15	0
Galvanised Flat Sheets C.R. and C.A.—			
20 gauge	72	8	6
24 gauge	75	19	0
26 gauge	81	5	0

ALUMINIUM AND ALUMINIUM ALLOYS

(Base Prices)		£	s.	d.
Sheet BS 1740 S1C 18 SWG (36 in. wide)... ...	per lb.		3	0½
Sheet BS 1470 NS3 Utility 18 SWG (36 in. wide)	,,		2	11½
Coiled strip BS 1470 S1C 18 SWG (24 in. wide)	,,		2	11½
Coiled strip BS 1470 NS3 Utility 18 SWG (24 in. wide)...	,,		2	11
Coiled strip high purity, 22 SWG (12 in. wide)	,,		3	2
Corrugated sheet BS 1470 NS3 Circular Profile 8 ft. × 32 in. × 20 SWG	per sheet	1	14	1
Corrugated sheet BS 1470 NS3 Industrial Profile 8 ft. × 31½ in. × 20 SWG	,,	1	19	10
Corrugated sheet BS 1470 NS3 Mansard Profile 8 ft. × 31½ in. × 20 SWG	,,	1	13	1
Extruded section BS 1476 E1C simple moulding	per lb.		2	10½
Extruded section BS 1476 E1C 1 in. diam. round	,,		2	8
Extruded section BS 1476 HE19WP simple angle	,,		3	2
Extruded section BS 1476 HE19WP 1 in. diam. round	,,		3	1
Tubing BS 1471 T1C 1½ in. O/D × 20 SWG ...	,,		4	8
Tubing BS 1471 HT19WP 1½ in. O/D × 20 SWG	,,		6	3

PLUMBERS' BRASS WORK, etc.

Delivered in London area.

All per dozen	B.S.S. ½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron...	87/-	128/-	—	—	—	—
Toilet bib cocks for iron ...	109/-	158/5	—	—	—	—

PLUMBERS' BRASS WORK, etc.—*continued*

All per dozen	¼ in.	⅜ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdownstopcocksforiron	66/–	95/9	188/–	363/–	522/6	917/6
do. with two unions for lead	89/–	132/–	234/4	472/–	623/6	1,389/6
Double nut boiler screws ...	18/8	26/5	47/6	48/6	67/–	93/6
Heavy Croydon ball valves	77/–	193/6	312/5	568/8	734/10	—
Plumbers' union brass lead to iron	19/6	23/6	38/6	52/10	70/6	165/–
	1½ in.	1¾ in.	2 in.	3 in.	3½ in.	4 in.
Caps and Screws	33/–	40/8	59/6	92/5	118/10	155/3
Brass Sleeves	—	31/11	31/11	56/2	74/10	91/5
	1¼×6 lb.		1½×6 lb.	2×7 lb.		3×7 lb.

Lead P. trap with brass cleaning screws 68/6 85/6 137/– 233/9
Lead S. trap do. do. 82/9 102/9 168/3 302/3

Solder :

			s.	d.
Plumbers' ...	1 cwt. lots	320/–	3	7
Tinmen's	" "	404/–	4	5
Blow pipe ...	" "	407/–	4	6

Copper Tubes and Sheets

Copper tubes BSS 659/1944 on the basic price of 27½d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 10 cwt.

	Extra d.		Total per lb. d.		Approx. per ft. d.
¼ in. × 19 gauge	16½		44½		12
⅜ in. × 19 "	14½		42½		16½
1 in. × 18 "	12½		40½		25½
1¼ in. × 18 "	12½		40½		30½
1½ in. × 18 "	12½		40½		36½
2 in. × 17 "	13½		41½		58½

Small Quantity extras :

10 cwts. to 5 cwts.	plus ½d.	per lb.
5 cwts. to 2 cwts.	" 1d.	"
2 cwts. to 1 cwt.	" 2d.	"

Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras 271 10 0

Zinc

	£	s.	d.
Sheet Zinc, 10 gauge (25 SWG), 5 cwt. lots upwards per cwt.	8	6	6
" " 12 gauge (23 SWG), " " " "	8	4	0
" " 14 gauge (21 SWG), " " " "	8	2	9

Brass Tube

Brass tubes, basic price, plus gauge and manufacturing extras ... ... per lb. 1 10½

LEAD SHEET AND PIPES

Basis selling price to one address in London or Home Counties :

		£	s	d.
Lead Sheet, English, 3½ lb. substance and upwards	per ton	104	15	0
" Water Pipe, in coils	"	107	0	0
Lead Soil Pipe, 10 ft. or over 2 in. to 4 in. in dia.	"	108	10	0
" " " over 4 in. dia.	"	110	10	0
" Gas or Untinned Compo pipe...	"	108	10	0

5 cwt. lots and over less 6d. per cwt. off basic prices.
Extras over Basis for quantities under 5 cwt. :

3 cwt. and under 5 cwt.	per cwt.	4	0
1 cwt. do. 3 cwt.	"	6	0

Smaller quantities than 1 cwt. priced specially.
Supplying sheet lead and lead pipes to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.
Allowance for Old Lead, collected, £53 0s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

		£	s.	d.
Coarse Pink in 1-ton loads and over delivered on site	per ton	8	11	3
do. White do. do. do.	"	9	0	9
Sirapite Coarse BSS 1191 Class C do.	"	9	2	9
do. Fine do. do. do.	"	9	10	6
do. Browning BSS 1191 Class B do.	"	9	2	9
do. Board Finish do. do.	"	9	2	9
Blue Lias Lime, in 6-ton loads	"	6	17	6
Hydrated Lime (Grey) in 6-ton loads	"	6	2	0
do. (White) do.	"	6	12	0
Lump Lime (Grey) do.	"	5	19	0
do. (White) do.	"	6	6	6
White Keen's or Parian Cement, in 1-ton loads ...	"	12	7	6
Pink Keen's or Parian Cement, in 1-ton loads ...	"	12	2	3
Granite Chips, in 6-ton loads	"	2	6	9
Hair	per cwt.	4	17	6
Gypsum Plaster Lath or Base Board, ⅜ in. thick, 600 yds. and over in one delivery. Delivered site	per yd.	2		2½
1,200 yds.	"	2		1½
do. Insulating do. ⅜ in. thick, 600 yds. and over in one delivery. Delivered site	"	2		8
1,200 yds.	"	2		7
Gypsum Plaster Wall Boards, 3 and 4 ft. wide 6 to 12 ft., ½ in. thick, 600 yds. and over in one delivery. Delivered site	"	2		5½
1,200 yds.	"	2		4½
do. Insulating do. ⅜ in. thick, 600 yds. and over in one delivery. Delivered site	"	2		11
1,200 yds.	"	2		10

PAINTS AND DISTEMPER

Delivered London area.

		£	s.	d.
Ceiling Distemper	per cwt.	1	7	6
Washable Distemper	"	5	18	0
Gloss Paint	per gal.	2	18	0
Super Snowcem cement paint (in 1 cwt. drums) ...	per cwt.	5	0	0

Lead Products and Oils

		£	s.	d.
Ground White Lead, in 1 cwt. kegs	per cwt.	8	7	6
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins	per gal.	3	6	6
Genuine Red Lead, Dry, (1 cwt. lots)	per cwt.	6	17	0
Genuine Linseed Oil Putty, 1 cwt. keg	"	2	13	6
Size XD quality 28 lb.	per tin		9	0
Raw Linseed Oil (5 gal.) drums extra	per gal.		16	9
Boiled Linseed Oil (5 gal.) do.	"		17	8

Sundries

Turpentine substitute (5 gal.) drums extra ...	"	5	4½
do. do. (40 gal.) do.	"	4	8½
Solignum, Brown (5 gal. cans) Exterior	"	10	0
Creosote (40 gal. barrels)	"	2	3
Paste Powder (1 lb. packets)	per lb.	2	4
White Lining Paper	per piece	1	4

VARNISHES, etc.

Delivered London area.

		£	s.	d.
Oak Varnish, Outside or Inside	per gal.	2	0	0
Oak, Pale Copal do. do.	"	2	0	0
Hard Drying Oak for Inside	"	2	5	0
Crystal Paper Varnish do.	"	2	8	0
Eggshell Flat Varnish do.	"	2	2	0
Finest Carriage Varnish	"	2	7	0
Front Door Varnish	"	2	4	0
Japan Gold Size	"	1	12	0
Black Japan	"	1	16	0
Brunswick Black	"	1	12	0
Berlin Black	"	1	10	0
Terebene	"	1	12	0
Knotting (1 gal. bottles free)	"	1	15	0
French and Brush Polish (do.)...	"	1	15	0

GLASS

Delivered London area.

	s.	d.
18 oz. Sheet Glass Ordinary Glazing Quality—Cut Sizes... ... ... per ft. sup.		10
24 oz. do. do. do. do. "	1	0½
26 oz. do. do. do. do. "	1	3
32 oz. do. do. do. do. "	1	7½
⅛ in. Rolled Plate... ... ... "	1	3½
⅜ in. Rolled and Rough Cast... ... ... "	1	6½
¼ in. do. do. ... ... "	1	7½
⅛ in. Figured Rolled and Cathedral, Standard patterns—		
White Group 1 ... ... "	1	3½
do. Group 2 ... ... "	1	9½
do. Standard Tints ... ... "	2	1½
do. Special Tints ... ... "	7	3
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating Group 3 ... ... "	1	8½
¼ in. Wired Cast up to 50 in. ... ... "	1	10½
¼ in. do. do. 50 in. to 72 in. ... ... "	2	2½
¼ in. Georgian Wired Cast ... ... "	1	11
Hollow Glass Blocks—		
P.B.2 Cross reeded 5⅜×5⅜×3⅞ in. ... ... each	3	9
P.B.3 Broad reeded 7⅜×7⅜×3⅞ in. ... ... "	5	9
P.B.32 Cross reeded 7⅜×7⅜×3⅞ in. ... ... "	5	9
P.B.4 Prismatic 7⅜×7⅜×3⅞ in. ... ... "	6	6
P.B.5 Flemish 7⅜×7⅜×3⅞ in. ... ... "	5	9
P.B.6 Boomerang 7⅜×7⅜×3⅞ in. ... ... "	6	6
Half Size Blocks—		
P.B.32 Cross reeded 7⅜×3¾×3⅞ in. ... ... "	4	10
Radiused Corner Blocks to match up with—		
P.B.2 Cross reeded ... ... "	8	1
P.B.3 Broad reeded ... ... "	9	8
P.B.32 Cross reeded ... ... "	9	8
P.B.2, P.B.3, P.B.32 are also supplied in Light Diffusing Blocks at same price.		
¼ in. Polished Plate Glass, G.G. quality—		
In plates not exceeding 2 ft. sup. ... ... per ft. sup.		4 7
" " " 5 ft. sup. ... ... "		5 7
" " " 45 ft. sup. ... ... "		7 6
" " " 100 ft. sup. ... ... "		7 6
¼ in. Polished Plate, extra sizes, i.e., plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality—Not exceeding 135 ft. sup. or 240 in. one way or 130 in. both ways ... "	11	4
Not exceeding 180 ft. sup. or do. ... ... "	15	0

Plates exceeding 180 ft. sup. prices on application.
Substances other than ¼ in. Polished Plate at Special Prices.
Quantity Tariff—Sheet and Sundry Glass.
The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass—	Minimum quantity	per ft. sup. s.	d.
18 oz. sheet O.Q.	3,000		7½
24 oz. " "	2,000		9½
26 oz. " "	2,000		11½
32 oz. " "	2,000	1	3½
⅛ in. Rolled Plate...	1,000		10½
⅛ in. Figured Rolled and Cathedral Standard Patterns, White Group 1	1,000		10½
do. Group 2	1,000	1	2½
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte Group 3	1,000	1	2½
⅜ in. Rolled Plate or Rough Cast	2,000	1	2
¼ in. do. do.	2,000	1	2½
¼ in. Wired Cast, Hexagonal up to 50 in. ...	2,000	1	5
¼ in. do. do do 50 in. to 72 in. ...	2,000	1	9
¼ in. Georgian Wired Cast	2,000	1	5½

THE BUILDER RATES OF WAGES

AS FROM FEBRUARY 6th., 1961. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors)

1. Craftsmen and Labourers.

Region	Craftsmen	Labourers
	s. d.	s. d.
England & Wales (Grade A) ...	5 0	4 4½
London	5 1½	4 6
Liverpool and District ...	5 1½	4 6
Scotland... ...	5 0	4 4½

2. Apprentices.

Age	Per cent. of Craft Rate	London and Liverpool Dist.	England, Wales
		s. d.	s. d.
15	25	1 3½	1 3
16	33½	1 8½	1 8
17	50	2 6½	2 6
18	62½	3 2½	3 1½
19	75	3 10½	3 9
20	87½	4 6	4 4½

3. Young Male Labourers.

Age	Per cent. of Craft Rate	London and Liverpool Dist.	England, Wales and Scotland
		s. d.	s. d.
15	33½	1 6	1 5½
16	45	2 0½	1 11½
17	66⅔	3 0	2 11
18	100	4 6	4 4½

NORTHERN IRELAND is not included; rates fluctuate so much from district to district that reference should be made to local offices.
WATCHMEN.—The rates per shift for watchmen engaged on building sites is 27s. 6d. in London and Liverpool District, and 26s. 3d. in the provinces.
FEMALE OPERATIVES.—In all districts throughout the country except in Scotland the rate of wages for women, aged 19 and over, engaged in craft processes is 4s. 1½d. per hour. Women engaged on work other than craft processes, 3s. 9½d. per hour. In Scotland the rate for the woman craftsman is 4s. 4½d. after a probationary period, and the woman labourer, 3s. 10½d.

Increases in Rates of Wages

Pay and Hours as from October 2

THE NATIONAL JOINT COUNCIL FOR THE BUILDING INDUSTRY has issued a notice reminding employers and employees that the new hourly rates of wages, decided upon last January, come into force on the second day of October. As previously announced, the National Joint Council has decided:

(a) That as from Monday, October 2, 1961, the normal weekly working hours shall be reduced from 44 to 42.

(b) That concurrent with the reduction in working hours the Grade A Standard Rate for Craftsmen shall be advanced to 5s. 6d. per hour.

The amendments to Rule 11(b)(i) of the Council's Constitution, Rules and Regulations, and to its National Working Rules necessary to give effect to the foregoing decision were published on May 11, 1961.

New Rates per Hour

1. CRAFTSMEN AND LABOURERS.

	London & Liverpool District	Grade A
Craftsmen ...	5s. 7½d.	5s. 6d.
Labourers ...	5s. 0d.	4s. 10½d.

2. APPRENTICES AND YOUNG MALE LABOURERS.

It is to be noted that this increase in Standard rates of wages will entail adjustment of the rates of wages for

(i) Apprentices.

(ii) Young Male Labourers.

Under the respective agreements the rates for Apprentices are a prescribed percentage of the craft rate and those of Young Male Labourers are a prescribed percentage of the Labourer's rate. The new rates of wages will be as follows:

APPRENTICES

Age	Per cent of Craftsman's Rate	London & Liverpool District	Grade A
15	25	1s. 5d.	1s. 4½d.
16	33½	1s. 10½d.	1s. 10d.
17	50	2s. 9½d.	2s. 9d.
18	62½	3s. 6½d.	3s. 5½d.
19	75	4s. 2½d.	4s. 1½d.
20	87½	4s. 11½d.	4s. 9½d.

YOUNG MALE LABOURERS

Age	Per cent of Labourer's Rate	London & Liverpool District	Grade A
15	33½	1s. 8d.	1s. 7½d.
16	45	2s. 3d.	2s. 2½d.
17	66⅔	3s. 4d.	3s. 3d.
18	100	5s. 0d.	4s. 10½d.

3. WATCHMEN.

On May 11, 1961, the Council gave notice that at its meeting on April 26 it had been decided to increase the shift rates for Watchmen employed in the Building Industry by 3s. per shift. The following are the rates due to be operated:

London and Liverpool Rate per shift, day or night	Provinces Rate per shift, day or night
30s. 6d.	29s. 3d.

4. FEMALE OPERATIVES.

The rates of wages of women aged 19 or over, engaged on craft processes, are fixed under National Working Rule 1(*l*) at 10½d. per hour below the Grade A Standard Craft Rate. This rate is subject to the same adjustment as may be made by the Council from time to time in the Grade A Standard Rate for Craftsmen.

The new standard rates for women engaged on craft processes, and the corresponding rates for women engaged on other than craft processes, and girls and young women under 19, are as follows:

	Rate per hour s. d.
(i) Standard Rate for Women aged 19 years and over	4 7½
(ii) Corresponding Rate for Women engaged on work other than craft processes	4 3½
(iii) Probationers (19 or over) on craft processes (period of probation —6 months):	
First month, Second month	4 3½
Third month, Fourth month	4 4½
Fifth month, Sixth month	4 5½
(iv) Girls and Young Women under 19:	
Age 15 (33½ per cent of Women's Standard Rate)	1 6½
Age 16 (45 per cent of Women's Standard Rate)	2 1
Age 17 (66⅔ per cent of Women's Standard Rate)	3 1
Age 18 (80 per cent of Women's Standard Rate)	3 8½

New Companies

THE FOLLOWING NEW COMPANIES, registered in England, have been announced by Jordan and Sons, Ltd., company registration agents.

A. E. PARRIS LTD.—Regd. August 23, 1961. 90 Chesterfield-rd. North, Mansfield, Notts. Secy.: Ena M. Parris. Bldrs., etc. Nom. cap.: £3,000.

BRITISH PLASTER & BOARDS LTD.—Regd. August 24, 1961. 15/17 Marylebone-rd., NW1. Secy.: E. R. Green. Bldrs. and contrs., mnfrs, of and dlrs. in plaster board, etc. Nom. cap.: £100.

COX & BUNYAN LTD.—Regd. August 24, 1961. 67-8 St. Aldates, Oxford. Secy.: J. Bunyan. Bldrs. and contrs. cd on at Cassington, Oxon., and at 29 New-st., St. Ebbes, Oxford, by S. H. Cox, J. Bunyan and Wilfred L. Parmenter etc. Nom. cap.: £7,500.

ARNOLD QUICK & COMPANY LTD.—Regd. August 24, 1961. la Barnfield-cres., Exeter. Secy.: E. Arnold. Bldrs. and decrs., etc. Nom. cap.: £1,050.

CHURCH HILL DEVELOPMENT COMPANY LTD.—Regd. August 24, 1961. 7 St. James-sq., Bristol 2. Secy.: Lyane L. F. Roydon. To develop land at Church Hill, nr Plymouth, Devon, as a housing estate, etc. Nom. cap.: £1,000.

R. L. HAWKINS LTD.—Regd. August 25, 1961. Eastways, Sandringham-rd., Fareham, Hants. Secy.: F. S. Hawkins. Bldrs., etc. Nom. cap.: £20,000.

CHAS. MCWILLIAMS (BARROW) LTD.—Regd. August 25, 1961. 155 Ainslie-st., Barrow-in-Furness. Secy.: Ivy Hart. Bldrs., etc. Nom. cap.: £5,000.

J. HEARN & SON (AMERSHAM) LTD.—Regd. August 28, 1961. 102 Chestnut-la., Amersham. Secy.: L. C. V. King, Bldrs. and decrs., etc. Nom. cap.: £3,000.

PERMALE DEVELOPMENT CO. LTD.—Regd. August 28, 1961. 2 West Borough, Wimborne, Dorset. Secy.: A. F. Perry. Nom. cap.: £100.

A. SMITH & SON (HUNDLEBY) LTD.—Regd. August 28, 1961. 'Hazledene,' Raithby-rd., Hundleby, Nr. Spilsby, Lincs. Secy.: Hazel E. L. Smith. Bldrs., etc. Nom. cap.: £6,000.

W. E. WISBEY & SON LTD.—Regd. August 29, 1961. 64 London-rd., Chelmsford, Essex. Secy.: R. D. Wisbey. Bldrs., etc. Nom. cap.: £5,000.

TECHNICAL REVIEW

This Review of plant, equipment and materials—in most cases new or with new features—is intended to give brief details only of the products mentioned. Notices are based on data supplied by the manufacturers. Additional information and prices can be obtained either direct or by using the prepaid Readers' Service form which appears on page 158 of this issue. The form can be used for more than one inquiry.

1. Boilers

A new range of GAS FIRED BOILERS has been announced recently which is made of cast iron with vitreous enamel coated flueway surfaces. There are four sizes: Diplomat 31, 44, 67 and 100, the figures being the output of Btu per hour in thousands. Small bore units can be fitted with a hand-wound clock or an electric programming switch, the pump being accommodated within the boiler casing. The casing is available in white, cream or a two-tone blue and ivory.
Thomas Potterton Ltd.,
20-30 Buckhold-road,
London, SW18.

2. Doors

An automatic DOOR OPERATOR for use on hinged and sliding doors in hotels, restaurants, clinics and stores, has recently been introduced over here from Switzerland. It is an electro-mechanical device which may be actuated from both sides of the door by a number of methods including a photo-electric cell, electric contacting floor mats using a 24 volt current, and pressure mats or similar 'pressure profiles' operating membrane contacts sensitive to pressure waves. A single phase AC power supply is required and the operator unit is effective for doors within a wide range of sizes and weights. In the event of a power failure, it does not interfere with manual operation and the door can be locked in the normal way.

The device can be mounted on almost any existing hinged door. The drive is by a rubber driving wheel which comes into contact with the floor. By fitting the longest possible lever arm, the designers have ensured that a minimum of force is required to move the door and the fact that the driving unit also gives support reduces the wear on hinges. The speed of opening can be selected within an approximate range of 1.5 to 2 seconds and controls are supplied for the regulation of the angle of the door and the length of time that it is held open.
Bolton Gate Co. Ltd.,
Bolton, Lancs.

3. Heating

One way of preventing heat escaping up the chimney is to lower the flue gas temperature by introducing cold air into the flue. This has the effect of reducing the draught and increasing the efficiency of the fire. It is on this principle that a DRAUGHT REGULATOR, that is already used on the Continent, operates.

It consists of a cast aluminium ring with two mounting lugs for clamping it on a collar, and a perfectly balanced aluminium damper which swings inside the ring on a stainless steel shaft. All materials used are rust proof and therefore resistant to the corrosive, sulphurous flue gases.

Two types of collar are available for fixing to the flue pipe; one is cylindrical for flat fixing into the chimney; the other has a round recess and lips for mounting on round pipes. To set, it is only necessary to fix the collar and then rotate the regulator in the collar so that the axis of the damper is in a suitable position for the draught required, between the horizontal where there would be a maximum of constant draught, and the vertical where there would be a minimum of draught. When the correct position has been determined, the ring is locked by tightening two screws, and no further adjustment is required.
R. S. Stokvis & Sons Ltd.,
12-16, High-street, Walton-on-Thames, Surrey.

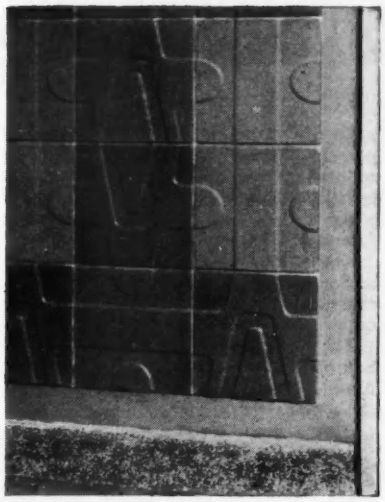
4. Paints

A highly protective paint incorporating 'Pliolite S-5,' a synthetic rubber resin made from the same materials as synthetic rubber, is being marketed after two years' research by a Bristol paint firm. The paint, 'Kolorplas,' can be used for interior decoration and, in addition, has a number of properties which make it suitable for exterior application.

Of particular interest is the fact that it is resistant to corrosive alkalis, inherent in all construction materials containing cement. It also has controlled self-cleaning: heavy rain will clean the paint but will do no damage to the surface. The paint keeps moisture and damp out but allows internal moisture vapour to escape. Because of its ingredients, it is resistant to chemicals, gases, mould growth, mineral and vegetable oil and grease. The manufacturers claim that the paint tin can be left open for several days without the paint forming a skin or solidifying. Should a skin form after long exposure, it can be stirred into the paint, where the skin will dissolve.
Henry Matthews & Co. Ltd.,
Charles-street, Bristol 1.

5. Wallpaper

At the recent New Homes Show, ALUMINIUM FOIL WALLPAPER was shown for the first time in one of the exhibition kitchens. This foil is backed with paper to assist hanging and can be fixed with ordinary Polycell adhesive. It is resistant to grease, moisture and stains, and its reflectivity can in some circumstances cut down the number of lights required. This product will probably be on the market in the New Year.
The Star Aluminium Co. Ltd.,
Wolverhampton, Staffs.



PRODUCING ARCHITECTURAL CONCRETE *by the use of plastic forms has been largely an American development. Similar materials are, however, being manufactured in this country by Tarmac Vinculum Ltd., of Ettingshall, Wolverhampton. The equipment has been designed and built by their own engineering staff, and one type of unit being produced is illustrated above. These are 12 in sq. profiled tiles which are secured by normal tiling technique. Cladding panels, approx. 3 ft. sq., for forming the outer skin of an 11 in. cavity wall have also been produced. One of the principal advantages with the plastic form is the elimination of a release agent and, consequently, one source of subsequent discoloration.*

6. Technical Publications

(*a*) SISSONS BROTHERS & CO. LTD. of Bankside, Hull, have published a brochure on 'Porterfleck,' their new multi-colour paint which can be applied in one spray operation. Apparently a new technical process has been found to make this possible. Colour particles, enclosed in a fluid sac, are introduced into a ground colour. These sacs hold the particles in suspension, preventing them from mixing with or blending into the ground colour, even at the moment of spraying. The colour particles are of sufficient size to give a strong and attractive visual texture to the surface. Another advantage with this paint is that, because of its molecular construction, it has an 'anti-static' property which prevents dirt and dust settling on the surface. This helps substantially in keeping maintenance costs low. The brochure is obtainable from the company.

* * *

(*b*) A booklet has been issued by FLAMINGO FOAM LTD. covering the closed cell flamingo foam. This insulant, which consists of 98 per cent still air and 2 per cent polystyrene, provides its own water and water vapour barriers and therefore is not affected by dampness and humidity. The booklet includes technical data and illustrated descriptions of the various uses for the foam. Copies from the company at 34 Victoria-street, SW1.

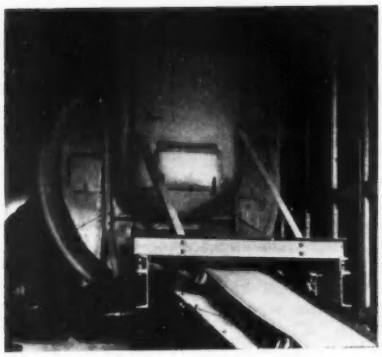
Seashore Sand Drying

New Plant in Operation Near Southport

SAND LOADED along the shores of Southport by the Southport Sand Co. Ltd. is reputed to be the best in Britain for foundry moulding work, and for many years this company has been supplying foundries all over the country.

Recently, a local firm, C. R. Alty Ltd., of Scarisbrick, opened up a new field by establishing the first drying plant in Lancashire.

The plant is supplied with sand by the Southport Sand Co. Ltd., and after the drying, it is delivered and sold by the supplying company. It is expected that supplies of dried sand will increase considerably as time goes on.



The Parker dryer that has been installed at the Scarisbrick works

Frederick Parker Ltd., the Leicester engineering firm, installed the plant at the firm's Woodlands Works, a few miles from Southport. Dry, even-grained sand is conveyed from the sandhills near this Lancashire holiday resort by lorries of the Southport Sand Co.

After drying and screening to extract shell and other foreign body content, the sand, which is extremely fine, is sold to foundries for moulding. The Parker equipment comprises a 12 cu. yd. feed hopper, a 30 ft. conveyor, a rotary dryer and a bucket elevator.

Sand brought to the works by lorry is tipped into the hopper and carried up by the belt conveyor into the rotary feed. Moisture content is constantly checked during the drying process and the whole operation is by one man, directed from a central control panel. After passing through the rotary feed, the sand enters a drying cylinder and is then fed into a cooler.

Small particles of shell scooped into the lorries with the sand are removed by a 30-mesh sieve and after this operation the sand enters the intake end of a bucket elevator. The buckets lift the sand 30 ft. onto another conveyor to be ploughed-off into bins.

The bins have a total capacity of over 300 tons and the doors are pneumatically operated. The loading bay is totally enclosed and equipped with motorised shutter-doors to prevent the sand blowing about when the wind is fierce.

Sand from the Southport seashore being unloaded into a dryer at Scarisbrick

Control of River Pollution

New Powers for River Boards

MR. HENRY BROOKE, Minister of Housing and Local Government, has sent to river boards and other interested bodies a circular (No. 39/61) explaining the effect of the Rivers (Prevention of Pollution) Act, 1961, which comes into effect on September 27. This Act, which arises from a Private Member's Bill, makes important changes in the existing law relating to the discharge of trade and sewage effluents into rivers.

Under the Rivers (Prevention of Pollution) Act, 1951, any new (i.e., post-1951) discharges into rivers require the consent of the river board, but pre-1951 discharges do not. Dischargers may be prosecuted for discharging poisonous, noxious or polluting matter, but none of these terms is defined. Following a recommendation of the Trade Effluents Sub-Committee of the Minister's Central Advisory Water Committee the new Act provides that pre-1951 discharges should be subjected to the same control as discharges which have begun since that time.

By an appointed day, which the Minister is to fix by order and which he cannot make earlier than September, 1962, but intends shall be as early as possible after that date, the persons responsible for the discharges must apply to the river board for consent to continue them. Once an application has been made the applicant is protected against prosecution until it has been determined. The river board may attach conditions to its consent, and the applicant then has three months in which he may appeal to the Minister against them.

The new control does not apply to tidal estuaries, except for a small number of tidal waters to which the pollution provisions of the 1951 Act were extended.

The circular lays emphasis on the view expressed by the Trade Effluents Sub-Committee that the new powers should be directed towards a gradual and carefully phased improvement which should take account of what it is reasonable and practicable to require from the individual discharger at any one time.

It points out that the Act makes special provisions for the issue of temporary consents and for the subsequent review and variation of conditions. River boards are asked to adopt a simple form of application for the small domestic discharge and to assist the discharger in its preparation.

Pipes and Pipelines Exhibition

A TECHNICAL CONVENTION will be held in conjunction with the Pipes, Pipelines, Pumps and Valves Exhibition on April 9-13, 1962, at Earls Court, London. This will be the first convention of this kind ever to take place in Britain. A convention committee has now been formed under the chairmanship of Sir Harold Hartley. This committee includes such distinguished experts as Messrs. H. R. Lupton (representing the Pipeline Industries Guild), T. W. Gibson (Institution of Gas Engineers) and R. W. Wynne-Edwards (Institution of Civil Engineers). Mr. J. A. Oates (editor, 'Pipes and Pipelines') will be acting as the secretary for this committee and all inquiries regarding the Convention should be addressed to him at 97 Old Brompton-road, SW7.

News in Brief

Clean Air Council Reappointments

THEIR EARLIER APPOINTMENTS having expired, Mr. Henry Brooke, Minister of Housing and Local Government, has reappointed the following people to serve as members of the Clean Air Council for a further period expiring on April 30, 1964: Sir Hugh Beaver, KBE; Mrs. D. M. Charlton, BSc, chairman, the Women's Advisory Council on Solid Fuel; Sir John Charrington, vice president, Coal Utilisation Council; Mr. P. B. Dingle, CBE, town clerk, Manchester; Councillor F. V. Magness, JP, vice-chairman, Willenhall UDC. The following new members have also been appointed for the same period: Lord Cohen of Birkenhead, president of the National Society for Clean Air; Mr. J. E. H. Davies, managing director, Shell-Mex and B.P. Ltd.; Mr. Ford I. Geddes, MBE, chairman of the Standing Technical Committee and of the General Council of British Shipping; Mr. C. T. Melling, CBE, deputy chairman, Electricity Council; and Dr. P. W. Reynolds, technical manager, Billingham Division of ICI Ltd.

Demonstration of Farm Buildings

AN OPPORTUNITY for farmers to inspect new and converted farm buildings in use in Essex and Hertfordshire has been arranged by the Agricultural Land Service, Government-buildings, Beeches-road, Chelmsford, from whom details may be obtained. Various farms are open on different days; details of the improvements will be supplied and a member of the Agricultural Land Service will be in attendance.

Costing Booklet

A PAMPHLET entitled 'Costing for the Estimator, Section 2' has been published by B. P. Davies, FGofS, from 156 Pytchley-road, Kettering, Northamptonshire. It gives the prices for machines, labour and materials for various trades and the final bill of quantities rate.

Solid Fuel Appliances

A LIST of amendments has been issued by the Coal Utilisation Council at 3 Upper Belgrave-street, London, W1, and the Solid Smokeless Fuels Federation at 74 Grosvenor-street, London, W1, to the 'Approved Domestic Solid Fuel Appliances'. It gives details of various open fires, heating stoves, cookers and independent boilers together with suitable fuels.

Employment in Building

THE NUMBER in civil employment during July is estimated to have increased by 39,000 to 23,904,000, according to statistics supplied by the Ministry of Labour. The number employed in the construction industries at the end of July fell by 15,000 to 1,577,000. This figure was, however, some 18,000 more than at the same time last year.

Hotel and Catering Exhibition

THE INTERNATIONAL HOTEL AND CATERING EXHIBITION is to be held at Olympia from January 23 to February 1, 1962. It will include new ideas in materials, furnishings, decor and lighting as well as exhibits of all items connected with the hotel trade.

National Fire Prevention Week

IN A NATION-WIDE effort to focus public attention on the menace of fire a National Fire Prevention Week is being sponsored jointly by the Fire Protection Association and the Royal Society for the Prevention of Accidents, from October 30 to November 4. The Week is being organised throughout the country by local fire authorities and the purpose is to bring home to the public the reality of the risk of fire and to give elementary guidance on means of prevention.

A House in a Furniture Store

INSIDE the Oxford-street store of Waring & Gillow Ltd. a completely furnished two-bedroomed house with garden is to be opened on September 18. Waring & Gillow's own specialist, collaborated with outside advisers and their aim has been to display good examples of well designed, up-to-date, high quality furniture in a completely natural setting. W. H. Colt Sons & Co., Bethersden, Kent, supplied and assembled the house, one of their Festival range of timber houses.

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OVERSEAS BUILDING

From Our Own Correspondents

AUSTRALIA.—Legislation to ratify an agreement for building a big Western Australian alumina refinery at Kwinana, near Perth, has been introduced in the State Parliament. The bill was introduced in the Legislative Assembly by the Minister for Industrial Development, Mr. Court. He said expenditure on the refinery in Western Australia would be £A10m. Mr. Court said work would begin on the Kwinana refinery later this year, and it would be in production in two-and-a-half years. A cheap source of coal for an aluminium smelter in Western Australia had not been found, and it was intended to build a smelter near Geelong, in Victoria, where 400m. tons of brown coal were readily available.

CANADA (NOVA SCOTIA).—$3.6m. is to be spent on the construction of technical training schools at Halifax and Sydney.

CANADA (QUEBEC). — The Canadian British Aluminum Co. plans a $36m. extension to its plant at Baie Comeau. . . . Perini Ltd. is to construct the $3.5m. second stage of the new laboratory for Canadian Industries Ltd. at MacMasterville.

CYPRUS.—Mr. Sidney Belfer, ARIBA, of Messrs. Lewis, Solomon, Kaye and Partners, is to plan a £½m. playground for a group of Cypriot restauranteurs. Plans include a 10-storey hotel, swimming, night club and casino. Completion is aimed for 1963.

DOMINICAN REPUBLIC.—The Department of Public Works has contracted with Elmhurst Construction Co. to continue work on the Ciudad Trujillo-Santiago highway. The latest contract covers $6m. worth of work and includes road-laying and bridge building. The first contracts on this work which will be the major road link in the Republic were signed in 1956.

HONG KONG.—Work will begin later this year on the first Government low-cost housing estate to be constructed in the fast-growing industrial new town of Kwun Tong in Hong Kong. The new estate, consisting of seven blocks each of seven storeys with accommodation for between 5,000 and 6,000 people, is expected to be completed towards the end of next year. Site formation is nearly finished and piling will start shortly. The site covers an area of about 187,000 sq. ft. Each block in the estate will have single living units placed on each side of a central corridor. The rooms will have a private balcony and communal cooking and toilet facilities will be provided. The estate will also include facilities for parking of vehicles, an internal service road and play areas. The Housing Architect is J. R. Firth, ARIBA, General Post Office Building, Hong Kong.

ISRAEL.—Caesarea Design Industries Ltd. plan a I£1m. furniture factory. . . . A metal file factory is to be built for Pim Metal Works Ltd., partly financed by Tius at Kiryat Malachi in northern Negav.

S. Australia's Early Buildings

A COMMITTEE to catalogue South Australia's early buildings and recommend action to safeguard their future has been announced by the president of the National Trust of South Australia. Adelaide architect Mr. Dean W. Berry, FRIBA, has been appointed chairman.

Bahamas Cement Industry

THE HOUSE OF ASSEMBLY is reported from the Bahamas by Barclays Bank DCO to have passed a bill which will enable Portland cement to be produced on a large scale in the Freeport area. Under the bill the Bahamas Cement Company will invest up to $50m. and will be granted a monopoly for a period of twelve years. It is reported that $30m. of the investment represents the estimated cost of the plant and equipment while an additional $10m. is required for supplementary raw materials and transportation, etc., and the remaining $10m. is for transport and distribution facilities.

Glazing Opportunity in Israel

THERE IS an opening in the Kfar Yerucham area for a glazing business for which buildings and housing units would be provided by the government. Loans are also available. Details can be obtained from Mr. Uri Carin, UK Representative, Economic Department, Jewish Agency for Israel, 217-219 Tottenham Court-road, London, W1, quoting reference 286/6/18.

Hotel Development in Israel

A PROJECT to include a 500-600-room hotel, a cinema, a theatre and two swimming pools has been announced in Israel. A representative for the investors, Murad H. Gabbay, 2 Beth Hamaaloth-street, Jerusalem, would like to hear from UK architects and consultants, and from suppliers of building materials, furniture and equipment who are interested.

Trade Supplement of Israel Newspaper

A SUPPLEMENT devoted to Anglo-Israel trade is to be published by 'Habooker' the Israel daily newspaper in October. Advertising information from Publishing and Distribution Co. Ltd., 177 Regent-street, London, W1.

Overseas Contracts Open

AUSTRALIA.—Tenders are invited for the construction of a six-lane prestressed concrete bridge, 1,662 ft. long, over the Georges River between Sans Souci and Taren Point. Copies of the specifications and drawings may be obtained or viewed and tender forms are available at the Department of Main Roads, Sydney, and the Agent General for New South Wales, 56/57 Strand, London, WC2. The prices are £1 5s. per set of specifications, £2 5s. per set of half-size drawings, and 5s. per sheet for full size drawings. Tenders close on February 1, 1962.

ISRAEL.—S. Gousman & Son Ltd. of 16 Hakishon-street, Tel-Aviv, Israel, who are importers and dealers in agricultural and industrial equipment wish to contact UK manufacturers of bitumised aluminium foil in corrugated and roll form, and of lift and escalator components.

SUDAN.—The Ministry of Works of the Republic of Sudan is to call for tenders for civil engineering works at the Khashm El Girba resettlement project. Details and specification will be obtainable at the Sudan Embassy, 4 Cleveland-row, London, SW1.

Export Training for Top Management

New Training Facilities at Sundridge Park

AN EXPORT TRAINING CENTRE for top management, the first of its kind in Britain, was opened on October 7 at Sundridge Park, Kent. It has been set up by the existing Management Centre at Sundridge Park to help the country's export drive by providing comprehensive training facilities on a residential basis.

Starting on September 11, three-week courses will be held at the centre at regular intervals. They have been planned in consultation with a special advisory panel set up for the purpose by the Federation of British Industries, and are intended for managing directors, export directors and all senior sales executives concerned with the promotion of export business. All the main factors affecting export policy and marketing procedures in present world conditions will be studied, and the principles and techniques discussed will apply equally to large and small organisations, irrespective of the type of product manufactured or marketed.

Subjects covered will include the selection of markets, the conducting of market surveys, appointment of selling agents, methods of determining prices, control of overseas sales forces and the most appropriate kind of advertising. Special attention will be paid to Common Market trading and selling to communist countries. Lectures will be given by members of the Sundridge Park staff and also by visiting speakers from industry, commerce, government departments and other official bodies. The interchange of experience will form an important part of the courses and special periods have been set aside for both formal and informal discussions.

Details about the new training facilities may be obtained from the director of Sundridge Park Management Centre at Bromley, Kent.

SCOTTISH BUILDER

A Smoke Control Area

FROM May 1, 1962, it will be an offence to emit smoke from chimneys within an area of smoke control at Sighthill, Edinburgh. The area affected covers over 200 acres on the south side of Gorgie-road and contains about 1,000 houses. This is the fifth of such proposals by Edinburgh Corporation which have been confirmed by the Secretary of State.

New £50m. Town

DETAILS HAVE been announced by the Secretary of State for Scotland, Mr. J. Maclay, for a new town, Scotland's fourth, to be built at Livingstone, in the Calders. The town will house at least 50,000 people, rising perhaps to 80,000, and will cost about £50m. to build. The project will be a 20-year task.

After talks with county officials, the next step will be to publish a Draft Order designating the area, and it is expected that work will be under way next year. Four-fifths of the population are expected to come from Glasgow under overspill arrangements.

Cost of Housing

THE AVERAGE price of new housing in Scotland has risen by more than 10 per cent in the last year, according to statistics issued in the Co-operative Permanent Building Society's latest 'Occasional Bulletin.'

New Buildings

CUMBERNAULD. — The Development Corpn. is to erect two advanced factories at Blairlinn industrial estate. They will be 20,000 sq. ft. each.

DUNDEE.—The Corporation's Housing Committee has approved extensive redevelopment plans for the city. The Derby-st. area of ½ acres will have two blocks of three-apartment flats, rising to 240 ft. The two blocks will each provide 176 houses on 22 floors. Cost is in the region of £1.25m.

EDINBURGH.—Dean of Guild Court has continued for planning consent a petition by the Corpn. for the erection of a multi-storey car park at Castle-terr. and King's Stables-rd. Est. cost is £350,000. . . . An interim warrant to allow preparation of ground for a new secondary school at Duddingston-rd., Portobello, was granted to the corporation by the Court. The school, nine storeys high and with room for about 1,500 pupils, will have workshops, a gymnasium and a swimming pool. The estimated cost is £700,000. . . . The Court also granted an interim warrant to the corporation for the preparation of ground for a new primary department for Holy Cross Academy at Ferry-rd., the cost of which is estimated at £130,000.

STIRLING.—Erection of 25 houses in the Newhouse area. Separate trades contract. Applications to the Burgh A. King-st., Stirling, by Sept. 18.

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THE BUILDER CONSTRUCTION NEWS

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list, see previous issues. Those preceded by the symbol (A) are advertised in this number. The latest date for the receipt of tenders or applications appears above each paragraph. The symbol (R) preceding each entry indicates that applications must be received by this date.

BUILDING

SEPTEMBER 22

(AR) BRISTOL CITY C.—Fixed price tenders for the erection of 25 one-bed flats at St. Judes. City A.

SEPTEMBER 23

CO. SLIGO VOCATIONAL EDUCATION COMMITTEE (Eire).—New vocational sch. at Gurteen, Co. Sligo, J. J. Gannon, QS, 17 Fitzwilliam-sq., Dublin. Dep. £10.

(AR) SOUTHAMPTON CBC.—Extension to south refreshment room at civic centre. Boro' A. Tenders by Oct 20.

SEPTEMBER 25

(AR) EAST SUFFOLK STANDING JOINT COMMITTEE.—Erection of a pair of police houses at Lowestoft. County A. Tenders by Oct. 20.

(AR) LEICESTER CC.—Firm price tenders for major alterations and additions to Ibstock sec. mod. sch. County A. Tenders by Nov. 20.

SEPTEMBER 26

(A) ALDRIDGE UDC.—(a) Erection of 228 dwellings and 50 garages at Ryders Hayes-la., Pelsall. (b) Erection of 12 flats, six bungalows and conversion of 'Queslade,' Great Barr, into eight bed-sitter units, etc. E&S. Dep. £2 2s. (each contract).

(AR) WEST SUSSEX CC.—(a) Stage two of new jun. sch. at Spierbridge-rd., Storrington, nr. Pulborough. (b) Major extensions at Chesworth prim. sch., Horsham. County A.

SEPTEMBER 27

(AR) DURHAM CC.—Erection of Seaham aged persons' hostel. County A.

(AR) NORTHAMPTON CC.—Fixed price tenders for a new sec. mod. sch. for boys at Cliftonville-rd. Ch. Ed. Officer.

SEPTEMBER 28

(AR) UXBRIDGE BC.—Erection of central depot at Harlington-rd., Hillingdon. Boro' E&S.

SEPTEMBER 30

(AR) MAIDENHEAD BC.—Firm price tenders for a public convenience at Ray Mead-rd. Boro's E&S. Dep. £2 2s.

OCTOBER 2

(AR) LEEDS REGIONAL HOSPITAL BD.—Alterations to the staff kitchen and dining room at De La Pole Hospital, Willerby, Yorks A to Bd. Dep. £2 2s. Tenders by Oct. 26.

OCTOBER 3

BELFAST CITY C.—Erection of 59 dwellings and 7 garages at New Barnsley estate extension. City Architect's Department (Housing Section), 97 Townsend-st., Belfast 13. Dep. £5.

(A) HAVANT & WATERLOO UDC.—Erection of eight flats and 12 houses, etc., at Cunningham-rd., Waterlooville. E&S.

OCTOBER 4

(AR) STAFFORDSHIRE CC.—Erection of infants' sch. at Wombourn, Planks-la. Clerk to C. Dep. £2 2s. Tenders by Nov. 15.

OCTOBER 5

(A) WIDNES BC.—Erection of 140 maisonettes at Ditton neighbourhood unit. Boro' A. Dep. £10 10s.

OCTOBER 6

(A) NEWBURY BC.—Erection of one block of four and two pairs of aged persons' dwellings at Gloucester-rd., Newbury. Boro' S.

OCTOBER 9

(A) FARNHAM UDC.—Erection of public convenience at Hart-rd. E&S. Dep. £2 2s.

(A) WELWYN GARDEN CITY UDC.—Fixed price tenders for the erection of a public convenience at Hall-gr. Chas. W. Fox, architect, National Provincial Bank-chbrs., Stonehills, Welwyn Garden City, Herts.

OCTOBER 11

(A) BOURNEMOUTH CBC.—Fixed price tenders for the erection of 59 beach bungalows at Manor Bay, Boscombe promenade, and Fisherman's Walk, Southbourne Promenade. Boro' A. Dep. £1 1s.

OCTOBER 13

(A) STAINES UDC.—Fixed price tenders for two pairs of houses, one three-storey block of 15 flats and maisonettes and 13 garages at Town-la., Stanwell, Middx. Clerk to C. Dep. £2 2s.

OCTOBER 16

(A) GILLINGHAM BC.—Fixed price tenders for six maisonettes, 14 flats and a clinic at Goudhurst-rd., Twydall/Hawthorne estate. Boro' E. Dep. £5 5s.

OCTOBER 20

(A) STAINES UDC.—Fixed price tenders for four pairs of houses, two three-storey blocks of 15 flats and maisonettes and 72 garages at Town-la., Stanwell. Clerk to C. Dep. £2 2s.

OCTOBER 23

(AR) EASTBOURNE CBC.—Erection of 24 flats and one detached house at Bourne-st. Boro' S. Dep. £2 2s. Tenders by Dec. 15.

DECEMBER 1

(A) LUTON BC.—Fixed price tenders for 147 flats and 59 garages at Farley Hill housing estate. Boro' A.

SERVICES, PAINTING, MATERIALS, ETC.

SEPTEMBER 28

(A) MANCHESTER CITY C.—Sanitary improvements at Mansfield Lodge. City A.

SEPTEMBER 29

(A) EALING BC.—Redecoration of Northolt Grange library, Yeading-la., and redecoration and minor repairs at Hanwell library, Cherington-rd., Hanwell, W7. Boro' E.

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MUNICIPAL AND CIVIL ENGINEERING WORKS, ETC.

OCTOBER 2

PORT TALBOT BC.—Supply of materials and construction of pipeline works on the River Neath Abstraction scheme. Works consist of approx. 2¼ miles of 18 in. dia. spun-iron pipeline with tyton joints, and 3¼ miles of 15 in. dia. spun-iron pipeline with tyton joints, together with valves and fittings. Binnie, Deacon & Gourley, engrs., Artillery-hse., Artillery Row, SW1. Dep. £10.

OCTOBER 6

BRIXWORTH RDC.—Laying of approx. 6,200 yd. of 6,9 and 12 in. dia. cast-iron, concrete and salt-glazed ware sewers, etc., and the construction of a sewage disposal works at Cottesbrooke and Creaton, Northamptonshire. Pick, Everard, Keay & Gimson, engrs., 6 Millstone-la., Leicester. Dep. £5 5s.

OCTOBER 16

CRANBOURNE RDC.—Fixed price tenders for laying of approx. 3¼ miles of 6 in. sewers, etc., at Colehill, Pamphill & Hampreston sewerage scheme, Pilford area. S. Dep. £5 5s.

EIRE.—Electricity Supply Bd.: Civil construction works for extension to North Wall Power Station, Dublin, to house one additional boiler with alterations to the existing station to suit a new turbo-alternator and other minor buildings. Bd's Chief Civil Engineer, Civil Works Dept., 21 Lower Fitzwilliam-st., Dublin. Dep. £10.

OCTOBER 21

(A) KEIGHLEY BC.—Extension to Abattoir. A. Sutherland, architect and surveyor, Barclays Bank-chbrs., North-st., Keighley. Dep. £2.

OCTOBER 31

COLWYN BAY BC.—Improvement of Clobryn-rd. to Tanrallt-rd., Llanddulas (Chester-Bangor trunk road scheme). Boro' E&S. Dep. £5 5s.

GENERAL BUILDING WORK

(LONDON)

FINCHLEY.—New Hospital Block.—A new casualty and outpatients dept. is to be built at Finchley Memorial Hospital. Est. £58,400.

ISLINGTON.—Planning Applications.—The LCC has received the following town planning applications: Erection of 24 one-bed. flats at Fortnum-rd. (MBC); new housing, 2, 4 and 10-storey blocks, at Newington Green-rd. (MBC).

PADDINGTON.—Planning Application.—R. Ward & Ptnrs., architects, have forwarded a town planning application to the LCC for the erection of shops and flats at St. George's burial ground/Connaught-st./Albion-st.

(PROVINCIAL)

ALDERSHOT.—Property Investment Consolidation Ltd. propose redevelopment of the old Hippodrome site with shops, offices, and a bowling alley.

ALNWICK.—United Automobile Services Ltd., Darlington, are to erect a new bus station at Clayport-st.

ASHTON-IN-MAKERFIELD.—Lancs. CC is seeking Ministry approval for the erection of a three-form entry grammar sch.

ATHERTON.—Eighty houses are proposed by the UDC for 1962.

BAKEWELL.—The Neburgh Engineering Co. propose erection of 22 dwellings at Bradwell.

BARNSLEY.—Bungalows are to be built at Monk Bretton by the BC shortly.

BERKS.—EC has approved following: Rebuilding of Windsor girls' grammar sch. (est. £263,268); stage one of new Wantage CMS sch. (est. £141,299); extension to Kennington sch. (est. £34,019); extensions at Charters CMS sch., Sunningdale (est. £40,460); improvements at Furze Platt county sec. sch., Maidenhead (est. £57,875); rebuilding of Boyne Hill CoE girls' sch. and St. Luke's CoE boys' sch., Maidenhead.

BILLINGHAM-ON-TEES.—UDC is to spend £100,314 on the erection of a second shopping block at Town-sq., Billingham. Architects are Elder and Lester, Midland Bank-chmbrs., Town-sq., Billingham. Plans

have been approved in principle. No contracts have yet been placed.

BILSTON.—Staffs. CC propose the erection of a mental health centre.

BLACKPOOL.—BC propose erection of multi-storey car park with restaurants at Princess-st. (est. £500,000).

BOOTLE.—The Imperial Cinema here is to be converted by the BC to form a public hall.

BOURNEMOUTH.—BC is to build two laboratories as extension to Municipal College, Lansdowne, and to modernise laboratory at Portchester sch., Portchester-rd.

BRIDGNORTH (Salop).—Residential development is proposed by the RDC for Rhea Hall.

BROCKENHURST (Hants).—County Planning Committee has granted planning permission for the erection of large country house with ancillary buildings and staff bungalow at Brockenhurst Park.

BURY.—Brunswick Bowling Ltd. is seeking a site for a 20-lane bowling alley, nursery and licenced club. Est. £300,000. . . . Following for BC: Extensions to Brandlesholme House for the Aged (est. £20,000); site for the erection of new aged persons' hostel £25,000).

COOKHAM.—Plans submitted to RDC: Rebuilding of works petrol station at Woodlands Park for W. R. Hammonds; extensions at Queens Head filling station, Water Oakley, for R. C. Jones; housing development fronting Woodlands Park-rd. for Mrs. E. Heynes; office building at Littlewick Green for the Southern Electricity Bd.

COVENTRY.—The City Council's Housing Committee has recommended to the Council that approval be given to the erection on sites at Queen-st./Windsor-st. of three 10-storey blocks of flats and maisonettes on a negotiated tender basis. An application for consent to a loan of £446,544 to meet the cost.

CUMBERLAND.—£162,000 has been set aside by the CC for a new sec. sch. at Longton.

DARLINGTON.—TC has received loan sanction for £56,748 for the erection of 46 houses on Firth Moor Estate. Plans by Boro' A (E. A. Tornbohm).

DAWLEY.—UDC propose extensions to Town Hall.

DURHAM.—Planning permission is being sought for the erection of shops and offices at North-rd. for Mr. K. Gradon, on North End, Durham. . . . The North Eastern Electricity Bd., Dunning-st., Sunderland, is to erect new area headquarters on site of a greyhound track at Holiday Park. Architects are L. J. Couves & Ptnrs., of Hood-st., Newcastle-on-Tyne. The prospect is still in its early stages.

HALIFAX.—Kaye, Howarth & Co., Huddersfield, propose erection of licensed premises, 41 garages and 4 shops at Mixenden-rd.

HAMPSHIRE.—County Planning Committee has approved for CC: Use of land at New-st., Lymington, for ambulance station; erection of prim. sch. at Burton Hall, Christchurch East; and use of land at adjoining Ashley CS sch., Hordle, for educational purposes.

HEXHAM.—Housing developments are proposed at Shaws Park for Shaws Park (Hexham), Ltd. The architect is D. Thomas, 2 Burdon-ter., Newcastle-on-Tyne.

HIGH WYCOMBE.—G. D. Searle & Co. Ltd. propose extensions to factory at Lane End-rd. Architects: Thurlow Lucas and Janes, 86 Easton-st., High Wycombe. . . . Nicholls and Janes Ltd. propose extensions at Queens-rd. Architects: Thurlow Lucas and Janes.

NEWCASTLE-ON-TYNE.—A contract is to be let by the City Council for the erection of a children's family group home on the Slatyford-la. estate. City Architect is G. Kenyon.

NORTH RIDING.—CC is to defer for six months consideration of tenders received for £143,000 extension scheme at the County Hall, Northallerton. Schemes proposed by the CC include a clinic at Eston to cost £24,750, health centre at Huntington to cost £26,470, and additions to highways depot at Northallerton £12,600. County Architect is R. A. Williams.

NOTTINGHAM.—The Equitable Life Assurance Soc. Ltd., London, propose erection of office and warehouse at Newark-st.

OXFORD.—Plans for a £150,000 motel have been sent to the City C by Watney-Lyon Motels, of London. Sixty bedrooms, each with a bath, are proposed in landscaped gardens near the city's northern by-pass.

SALE.—R. R. & J. Willan Ltd. propose erection of a multi-storey hotel at Dane-rd.

SALISBURY (Hants).—The County Planning Committee has approved Wessex Regional Hospital Bd.'s proposals for large-scale extensions to Coldeast Hospital to include 40-bed hospital and assessment unit; 2 villas (each of 40 beds); central kitchen; staff dining room and provision store; general store and boiler house; an occupation centre; recreation hall; seven pairs of staff houses; 4 staff maisonettes; and the adaptation of The Mansion for various ancillary purposes.

SALFORD.—A block of six 3-storey houses, and garages, are planned for Moorla., Kersal, by S. Cookson & Son.

SALFORD.—Improvements to the Royal Infirmary, costing £57,000, are proposed by the Manchester Regional Hospital Bd.

SEDGEFIELD.— RDC is continuing its efforts to buy land for the erection of £150,000 swimming baths. It is not expected, however, that the work will be able to proceed for at least four years.

SHEFFIELD.—TC propose erection of a 40-place remand home at Limb-la., Dore. . . . Sheffield Wednesday Football Club propose extensions to stand at Hillsborough.

SKIPTON.—UDC propose erection of 44 old peoples' bungalows at Rectory-la. . . . RDC is seeking a site for office accommodation and meeting room.

SLOUGH.—L. H. Hubbard proposes erection of new factory and offices at 177 Bath-rd.

SOUTHAMPTON.—The County Planning Committee has granted planning permission for the erection of engineering laboratories for research and development and a synchrous condenser house, and for temporary buildings to be used as offices and laboratories for approximately five years, at Marchwood Generating Station for Central Electricity Generating Bd.

SOUTH ASCOT.—St. Francis RC Auth. propose erection of new RC sch.

STAFFS.—CC propose erection of new county sch. at Ashley.

STANDISH-WITH-LANGTREE. — UDC propose erection of 24 dwellings at Larkhill estate.

STOCKPORT.—A shop in London-rd., Hazel Grove, is to be converted into a supermarket by Cooper's Ltd.

STOCKTON-ON-TEES. — Premier Dwellings (Cleveland) Ltd., Albert-rd., Middlesbrough, are seeking planning permission for the erection of multi-storey flats at South-rd., Norton. . . . N. Stonehouse (Stockton) Ltd., builders and contractors, Northcote-st., Stockton, are seeking permission to erect houses at Darlington-rd., Stockton. . . . Detailed plans have been prepared for 159 houses proposed near Lonesome Hall Farm Estate, Fairfield, by Moorhouse & Barker Ltd., builders, 100 Thornaby-rd., Thornaby-on-Tees. . . . J. W. Cameron & Co. Ltd., Lion Brewery, West Hartlepool, are to erect hotel at Dover-rd., Stockton. . . . Broughs Ltd., grocers and provision merchants, Oxford-st., Newcastle-on-Tyne propose shop and maisonettes on the Hardwick-estate, Stockton. . . . The Power-Gas Corporation, Stockton, are to erect new laboratory at their Parkfield Works, Stockton. . . . Mr. R. S. Taylor, 109 Hartburn Village, Stockton, is to erect two-storey shops with showrooms above at Yarmla. . . . Plans have been approved for 32 houses near Hartburn-ave. for Gray & Son Ltd., builders, Tynedale-st., Stockton. . . . Maddox Ltd., West Row Mills, Stockton, are to erect a two-storey shop and store in Bishop-st., Stockton.

STOCKTON - ON - TEES.—British Titan Products Ltd., Billingham-on-Tees, are to adapt a factory at Stockton (formerly occupied by Phoenix Telephone and Electric Works Ltd.) as research and technical service departments. . . . W. and T. Avery Ltd., Prudhoe-st., Newcastle-on-Tyne, are considering the erection of showroom, light workshop, etc., at Portrack-st., Stockton. The scheme is still in early stages. Architects are Marshall and Tweedy, 36 Blackett-st., Newcastle-on-Tyne.

SUNDERLAND.—Sunderland and South Shields Water Co., 29 John-st., Sunderland, propose depot and offices at South Hylton. Negotiations are proceeding for the site. During 1962 the TC intend obtaining tenders for the erection of 1,200 houses. Layout plans have been prepared by the Borough A. (H. C. Bishop), for the erection of flats and maisonettes (160 dwellings) in the Parade Area, Sunderland. . . . Tenders are being obtained by the TC for the erection of batches of houses totalling 137 dwellings on the Pennywell, Thorney Close, Town End Farm, Hylton Red House, and Grindon estates, Sunderland. Plans are by the Borough A.

SURBITON.—High Speed Service Tool Co. propose rebuilding of premises at 70 St. James-rd.

TWYFORD.—Wokingham RDC has approved outline scheme for development at Whit-la. for A. A. C. Godsal, Haynes Hill.

TYLDESLEY.—UDC propose residential development at Sandy-la. Farm/Church-rd.

URMSTON.—UDC is to approach private firms in connection with the redevelopment of town centre.

WALLASEY.—Negotiations are now taking place between the British Transport Commission and UDC for land adjoining Dock-rd., as future industrial site.

WALTON AND WEYBRIDGE.—UDC propose erection of aged persons' dwellings at Esher-rd.

WATFORD.—Westminster RC Diocese propose new RC prim. sch. at Garston. Architects: Archard and Partners, 20 Lowndes-st., London, SW1.

Contracts Placed

We are glad to receive from architects and quantity surveyors for publication details of contracts placed to the value of £20,000 or over. Such information should reach the Editor as soon as possible after the contract is signed. Names of the architect and other consultants associated should be given.

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WATFORD.—A youth centre to be built over a recently constructed car park is est. to cost £85,000. Furnishings and equipment will cost a further £15,000. The centre will be of concrete construction, two-storey high, to which a third storey could be added. It will include a hall to seat 400 people, projection room for films, gymnasium and several multi-purpose rooms.

WEST MOLESEY.—Hurst Park Racecourse is to be developed by Wates Ltd., London. Houses will be erected on the site. Work will commence in 1963.

WIGAN.—Thirty-nine dwellings and four flats are to be constructed at Drummond-sq. for the BC.

WILLENHALL (Staffs).—CC propose erection of adult hostel.

WOKINGHAM.—The Wokingham Motor Co. Ltd. propose erection of 36 houses at Finchampstead-rd. Inquiry held.

WOODLEY.—G. Wimpey & Co. Ltd. propose 7½ acre housing site at Fosters-la.

TENDERS

(A) Denotes *accepted.*
(PA) Denotes *provisionally accepted.*
(RA) Denotes *recommended for acceptance.*
(AM) Denotes *accepted subject to modification.*
(GD) Denotes *accepted subject to approval by appropriate Government Department.*

ABINGDON.—Erection of 12 old people's flats at Steventon for RDC. (A) F. J. Minns & Co. Ltd., Oxford.

BERKS.—Following for CC: Supply of classrooms for 7 schools. (A) Terrapin Ltd., London, £22,000. Extensions at Farrington county girls' grammar sch. (A) J. Smallbone & Co. Ltd., Goring-on-Thames, £72,009. Extensions at Mrs. Bland's controlled sch., Burfield. (A) Francis Bros. (Builders) Ltd., Reading, £42,060.

BERKS.—School extension at Didcot for CC. (A) F. J. Minns & Co. Ltd.

BILLINGHAM.—Design and construction of a west area workshop and depot for ICI Ltd. (A) T. G. Construction Ltd., £60,000.

BIRMINGHAM.—Following for City C: Extensions to Perry Beeches sec. sch. (A) J. & F. Wootton Ltd., Walsall, Staffs., £29,856. Remodelling of Stirchley jun. and infants' sch. (A) W. T. Pickering, Moseley, Birmingham 13, £21,196. Erection of 29 dwellings and 23 garages at Willaston-rd., Elms estate. (A) Morris & Jacombs Ltd., Small Heath, Birmingham 10, £66,345. Erection of 98 garages at Bartley Green, Harborne, and Northfield. (A) M. Woods Ltd., King's Heath, Birmingham 14, £27,462.

BLAYDON (Co. Durham).—Erection of 18 bungalows and two houses at Cowen-ter., Rowlands Gill, for the UDC. Plans by Surveyor. (A) Direct labour.

BOREHAM WOOD. (Herts).—Erection of shops at Shenley-rd. for Messrs. Sadomar Investments Ltd. Architects: M. A. C. Simmonds & Ptnrs., London, NW4. (A) Howard Farrow Ltd., £72,500.

BRISTOL.—Extensions to dental hospital for United Bristol Hospitals. (A) John Laing Construction Ltd., London. New shops at East-st./Herbert-st. for Harts. Footwear Ltd. (A) S. P. Lewis Ltd.

CANNOCK.—Erection of 24 dwellings, 3 shops and 14 garages at Dogintree estate for RDC. (A) C. Hall (Heath Hayes) Ltd.

CARLISLE.—New offices at Durranhill industrial estate for Automatic Coal Cleaning Co. Architect: G. W. Danson, 54 Lowther-st., Carlisle. (A) John Laing Construction Ltd., Dalston-rd., Carlisle.

CHELTENHAM.—New branch library at Hesters Way for CBC. Boro E is W. E. C. Bird. (A) Ford & Weston Ltd., £27,027. New private patients' wing at Cheltenham General Hospital for the Cheltenham Group Hospital Management Committee. Architects: Healing & Overbury. (A) Ford & Weston Ltd., £40,484.

DIDCOT (Berks).—Erection of 31 houses and roads for NIRNS. (A) Frederick J. Minns & Co. Ltd., Botley, Oxford.

DUNGANNON (Co. Tyrone).—Erection of 158 houses and 12 garages at Coalisland for RDC. (A) Mullan Bros., Garvagh, £232,748.

DURHAM.—Erection of Lanchester New Endowed Parochial (controlled) sch. for CC. County Architect is G. W. Gelson. (A) A. Gilmore Ltd., Langley Moor, Durham, £57,262.

ETON.—Erection of new dwellings at Agar Plough for Eton College. (A) R. E. Woods, Windsor.

FRIMLEY.—Erection of 123 dwellings and 115 dwellings for Lendore Properties (Malden) Ltd. (A) Baileys (Builders & Contractors) Ltd., 2a Albert-rd., Malden.

GUILDFORD.—New radiotherapy centre at St. Luke's Hospital for South-West Metropolitan Regional Hospital Bd. (RA) C. Neal & Son Ltd., West Horsley.

HECKMONDWIKE.—Offices and garage at Swallow-st. for Potteries Motor Traction Co. Ltd. (A) George Horstall & Son Ltd.

HEMEL HEMPSTEAD.—New RC prim. sch. at Adeyfield for RC Diocese. (A) Fassnidge, Son and Norris Ltd., Uxbridge.

KENDAL (Westmorland).—New factory for the Milk Marketing Board. (A) John Laing Construction Ltd., Dalston-rd., Carlisle.

LICHFIELD.—Three blocks 8-storey flats at Wheel-la. estate for TC. (A) Wates Ltd., London.

LIVERPOOL.—New shopping centre at Maghull for Ravenseft Properties Ltd. Architects: K. Wakeford, F. Jerram & Harris, London, W2. (A) Holland & Hannen and Cubitts (North West) Ltd., £162,000.

(GD) LONDON (Admiralty).—Contracts over £4,000 in value: *Fife:* Re-decking; J. R. & A. Adam Ltd., Lochgelly. *Cornwall:* Modernisation of latrines; Dudley Coles Ltd., Plymouth. *Kent:* Construction of piled foundations; Concrete Piling Ltd., London, SW1.

(GD) LONDON (Air Ministry).—Contracts to the value of £4,000 or over for week ended September 8: *Building work:* Burderop, Wilts.; F. Rendell & Sons Ltd.; Devizes, Wilts. Edzell, Angus; R. Pert & Sons Ltd., Montrose, Angus. Wittering; Bosworth, Wakeford & Stepnell Ltd., Rugby, Warwicks. *Surfacing work (existing paved areas):* West Raynham, Norfolk; The Limmer & Trinidad Lake Asphalt Co. Ltd., Vauxhall Bridge-rd., London, SW1. *Painting work:* Cranwell and Digby, Lincs; C. J. Else & Co. Ltd., Lincoln. *Artificers' work:* Quedgeley, Glos.; Wm. T. Nicholls Ltd., Gloucester. *Preparation and maintenance of land:* Honington, Wattisham, Bentwaters (Suffolk) etc.; Turfsoil Ltd., Greenwich, London, SE10. Woodbridge, Bawdsey (Suffolk), etc.; Clarke Demolition & Construction Co. Ltd., Waldringfield, Woodbridge, Suffolk. *Electrical installation work:* Fylingdales Moor, Yorkshire, F. H. Wheeler & Co. Ltd., Newcastle-upon-Tyne. Carlisle; Geo. Bowman Ltd., Carlisle.

(GD) LONDON (British Railways).—Recent contracts placed by Southern Region:—*London (Eastern) District:* Resurfacing and surface dressing of pootpaths and platforms; Durable Asphalte Co. Ltd., London, N1. *Exmouth Junction:* New Water Tower at motive power depot; Carter-Horseley (Engineers) Ltd., Crawley, Sussex. *Wimbledon Park:* Renovations to carriage cleaning sheds; Alfred Bagnall & Sons, Ltd., Teddington, Middx. *Sittingbourne;* Station renovations; C. & T. Painters Ltd., London, NW10. *Wokingham:* Part reconstruction of Robin Hood-la. bridge; Aubrey Watson Ltd., Henley-on-Thames, Oxon. *Exmouth Junction:* New brake shop; Sidney Pratt (Builders) Ltd. Exeter. *Charing Cross:* Resurfacing of Hungerford footbridge; Durable Asphalte Co. Ltd., London, N1. *Lancing carriage & wagon works:* Improved ventilation to carriage & paint shops; Brooks Ventilation Units Ltd., Croydon, Surrey. *Stewarts-la. depot:* Demolition of coaling plant; The Demolition & Construction Co. Ltd., London, SW1. *Hither Green:* Repairs to Manor-lane bridges; The Demolition & Construction C. Ltd.

(GD) LONDON (British Railways).—Recent contracts placed by the North Eastern region: Alterations and additions to staff amenity buildings at Bradford Valley goods depot; Totty & Sons Ltd., Bradford.—Improvement of staff amenity block and provision of cycle shed at Goole; L. Ward & Co. Ltd., Selby.

(GD) LONDON (War Dept.)—Recent contracts placed for the week ended Aug. 25: *Berks.:* Painting and decorating at Newbury; T. H. Kenyon & Sons Ltd., London, W9. *Essex:* Roadwork at Colchester; H. V. Smith & Co. Ltd., London, NW1. *Hampshire:* Miscellaneous at Netley area; Wm. Bell & Sons (Andover) Ltd. Miscellaneous work at Blackdown area; Wm. Herd & Co. Ltd., London, W.1. Electrical work at Aldershot; R. F. Webb Ltd., Southampton. *Norfolk:* Building at Cranwich and West Tofts; W. F. Pointer & Sons Ltd., Norwich. *Northumberland:* Building at Berwick-on-Tweed; Berwick Building Co. *Stirlingshire:* Electrical at Stirling; Sturrock Power Installations Ltd., Edinburgh. *Surrey:* Roofing at Camberley; J. G. Tuxford, London, SE18. *Warwickshire:* Fabric renovation at Kineton; Coleman & Tyas Ltd., Bidford-on-Avon. Site clearance at Kineton; J. Bernard & Sons Ltd., Rugby. *Yorkshire:* Building at Catterick Camp; C. Chapleo & Sons Ltd., Leyburn.

(GD) LONDON (War Dept.).—Contracts placed for week ended September 1: *Berkshire:* Electrical at Didcot; Electrical Installations Ltd., London, SW1. Building at Windsor; Kirk & Kirk Ltd., London, SW15. *Cheshire:* Heating at Radway Green; Arthur Heaton & Co. Ltd., Liversedge. *Hampshire:* Building at Bordon; J. M. Hill & Sons Ltd., Wembley. *Inverness-shire:* Heating and hot water at Grantown-on-Spey; Clyde Fuel Systems Ltd., Glasgow. *Oxfordshire:* Concrete bases at Bampton; Costelloe's Plant Hire Co. Ltd., Cheltenham. Dismantling and re-erecting aerials at Bampton; Pirelli General Cable Works Ltd., Southampton. *Somerset:* Installation of oil heaters at Watchet; E. R. Carter, Yeovil. *Warwickshire:* Painting at Long Marston; R. B. Warner, Shrewsbury.

MANCHESTER.—Erection of multi-storey office block and car park at Pall Mall for Central & District Properties Ltd. (A) Contractors (Manchester) Ltd., Stockport, Ches.

MARYLEBONE.—New RC Church for Auth. Architects: F. G. Broadbent & Ptnrs. (A) Griggs & Sons, £137,186.

MORDEN.—Erection of St. Lawrence's Church for PC Council. (A) Carlton Contractors Ltd., Epsom.

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B15/9/61

for City C. City Architect is George Kenyon. (A) Leslie & Co. Ltd., Woodland-rd., Darlington. £782,000.

NEW SARUM (Salisbury).—Fixed price tenders for six bungalows, 15 houses, 56 flats and 20 garages, etc., at Essex-sq. redevelopment, for City C. (RA) John Prichard Ltd., 42/44 Salt-la., Salisbury, £116,307.

NOTTINGHAM. — Factory extension at Colwick-rd. for C. V. Kemp. (A) W. H. Herries Ltd.

PRUDHOE (Northumberland). — Conversion of cinema into swimming pool for UDC. Surveyor is W. C. Ireland. (A) R. Bowey & Son Ltd., William-st. south, Gosforth, Northumberland (loan sanction being sought for £45,000).

READING.—Warehouse and offices at Bennett-rd. for P. Phillips & Sons Ltd. (A) Claude Fenton Ltd., Rosekiln-la., Reading.

ROCHDALE.—Extensions to bus depot at Mellor-st. for BC. (A) R. & T. Howarth Ltd.

SHEFFIELD.—Office and warehouse at Scotland-st. for Robert Neill & Co. (Sheffield) Ltd. (A) F. Robson Ltd. Erection of 296 flats at Gleadless Valley estate for TC. (A) M. J. Gleeson (Contractors) Ltd.

SLOUGH.—New general hospital at Wexham Park for North-West Metropolitan Regional Hospital Bd. (RA) Humphreys Ltd., 199 Knightsbridge, London, SW1.

SUNDERLAND.—Erection of RC sch. at Pennywell. Architects: P. J. Stienlet & Son, 4 Queen-sq., Newcastle-on-Tyne. (A) D. Glen Ltd., Albert-rd., Jarrow, Co. Durham.

TADWORTH.—Extensions to the Church of the Good Shepherd for the PC Council. (A) Norman and Burt Ltd., Burgess Hill, Sussex.

TRENCH.—New factory at St. George's-rd. for Castos Ltd. (A) Sir Alfred McAlpine & Son Ltd.

WALLASEY.—New sports pavilion at Lingham Park for BC. (A) T. W. Glover & Sons Ltd. Erection of three 5-storey blocks of flats at Leasowe for BC. (A) John McGeoch & Sons Ltd.

WALLINGFORD.—Erection of 30 houses and roads for BC. (A) F. J. Minns & Co. Ltd., Oxford.

WALSALL.—Erection of eleven 3-storey blocks of flats, 36 multi-storey blocks of flats, 19 shops with maisonettes over, and 127 garages at Leamore redevelopment area for BC. (A) Wates Ltd., London.

WORKINGTON.—New car showroom at Finkle-st. for Myers & Bowman Ltd. (A) John Twiname Ltd.

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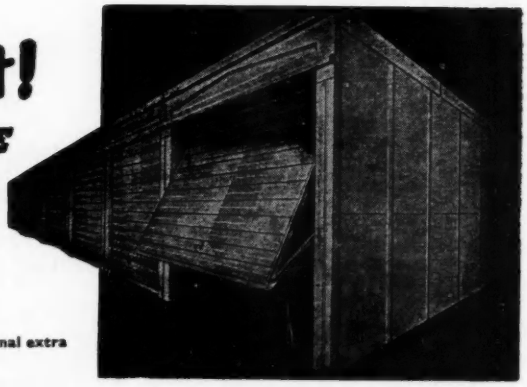
- Free Advisory Service
- 3 Years' Guarantee
- Hinged or Up & Over Doors
- Purchased by over 300 Councils
- Wooden roller shutter doors optional extra
- Extensive Free Delivery Area



Write for illustrated brochure to:-
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Also 66 New Islington, Manchester 4 & 123 Shepperton Rd., London, N.1.